CHANGE

No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC28 April 1992

LUBRICATION ORDER

HOWITZER, HEAVY, SELF-PROPELLED:
8 INCH, Ml 1 OA2
(2350-01-041-4590)

LO 9-2350-304-1 2, 27 April 1 990, is changed as follows:

1. Remove old pages and insert new pages as indicated below.

2. New or changed material is indicated by a vertical bar in the margin of the page.

3. Revised illustrations are indicated by a miniature pointing hand

Remove Pages	Insert Pages
Card 1 of 44 through Card 10 of 44	Card 1 of 44 through Card 10 of 44
Card 33 of 44 through Card 36 of 44	Card 33 of 44 through Card 36 of 44
Card 43 of 44/(Card 44 Blank)	Card 43 of 44/(Card 44 Blank)

4. File this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
01212

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LUBRICATION ORDER **LO 9-2350-304-12**

27 April 1990 **(Supersedes LO 9-2350-304-12; 25 December 1984)**

HOWITZER, HEAVY, SELF-PROPELLED: 8-INCH, Ml 1 0A2
(2350-01-041-4590)

Reference: TM 9-2350-304-10, TM 9-2350-304-20

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REPORTING OF ERRORS

You can improve this publication by calling attention to errors and by recommending improvements and by stating your reasons for the recommendations. Your letter or DA Form 2028, Recommended Changes to Publications and Forms, should be mailed directly to: Commander, US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MAS, Rock Island, IL 61299-6000. A reply will be furnished directly to you.

This lubrication order is divided into seven sections based on lubrication intervals (daily, weekly, quarterly (3 months), semiannually (6 months), annually (12 months), 11/2 years (18 months), and on-condition).

An overall view showing lubrication points precedes each set of detailed notes.

A broken leader line (- - -) means there are lubrication points on both sides of the vehicle.

Intervals are based on normal operation.

- Lubricate more during constant operation.
- Perform a quarterly lubrication as soon as possible after water fording operation.
- On-condition intervals for oil changes shall be determined by the Army Oil Analysis Program (AOAP) laboratory and shall be applied unless otherwise notified.
- For operation of vehicle in protracted cold temperatures below ^{00F} (-180C), remove lubricants prescribed in the key for temperatures above ^{00F} (-180C), clean parts with dry cleaning solvent, and relubricate with lubricants specified in the key for temperatures +40OF to -70OF (+40C to -57'C).

MAN-HOUR TIMES

The man-hour time specified is the time you need to do all the services prescribed for a particular interval.

LEVEL OF MAINTENANCE:
- C-Operator/Crew
- O-Unit Maintenance

LUBRICATION POINTS

Type of lubricants used at each point are identified by arrows:

CLP GAA

OBSERVE THE FOLLOWING:
- NEVER use the wrong type lubricant.
- NEVER use too much lubrication.
- ALWAYS clean grease fittings before lubrication.
- ALWAYS use the lubrication order.

LO 9-2350-304-12

KEY

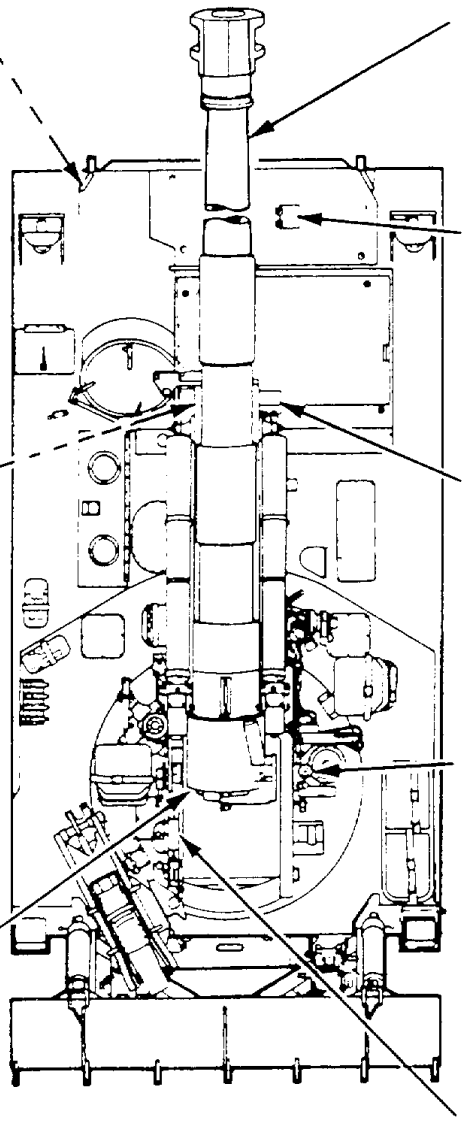
LUBRICANTS		CAPACITIES	EXPECTED TEMPERATURES			INTERVALS
			Above 0 °F (Above -18 °C)	Below +40 °F (Below +4 °C)		
OE/HDO (MIL-L-2104D)	LUBRICATING OIL, Internal Combustion Engine, Tactical Service		OE/HDO-15/40	OEA	For Arctic operation refer to FM 9-207.	D - Daily W - Weekly Q - Quarterly 750 mi (1207 km), or 75 hr of operation, whichever occurs first S - Semiannually, 1500 mi (2414 km), or 150 hr of operation, whichever occurs first A - Annually B - 18 months OC - On-Condition
OEA (MIL-L-46167)	LUBRICATING OIL, Internal Combustion Engine, Arctic					
	Engine Crankcase, Add Three Additional Quarts (2.8 l) for Filters.	Refill 28 qt (26.5 l) Dry 38 qt (35.9 l)				
	Auxiliary Drive	Refill 4 qt (3.8 l) Dry 4½ qt (4.2 l)				
	Final Drive (Left)	13 qt (12.35 l)				
	Final Drive (Right)	7 qt (6.65 l)				
	Auxiliary Drive Clutch Housing	Refill 3/4 pt (0.35 l) Dry 7/8 pt (0.40 l)				
	Road Wheel Hub Bearing and Trailing Idler Hub Bearing		"O" Vehicles OE/HDO-15/40	"O" Vehicles OEA		
			"N" Vehicles GAA	"N" Vehicles GAA		
	Transmission	Refill 12 gal (45.4 l) Dry 19 gal (72 l)	OEA OE/HDO-15/40	OEA		
	Elevating Gearcase	2 qt (1.9 l)	OEA	OEA		
	Traversing Gearcase	3 qt (2.8 l)				
OHT (MIL-H-6083)	FLUID, HYDRAULIC, PETROLEUM BASE, PRESERVATIVE					
	Hydraulic Reservoir	27 gal (102.2 l)	OHT	OHT		
GAA (MIL-G-10924)	GREASE, Automotive and Artillery		ALL TEMPERATURES			
CLP (MIL-L-63460)	LUBRICANT, CLEANER and PRESERVATIVE		CLP	CLP		
	Cannon Bore and Breech Mechanism Oil Can Points					
SD2 (P-D-680)	SOLVENT, Dry Cleaning		ALL TEMPERATURES			

TOTAL MAN-HOURS		TOTAL MAN-HOURS	
Interval	Man-Hours	Interval	Man-Hours
D	2	A	5
W	5	B	50
Q	14	OC	2
S	12		

DAILY NOTES

This page shows what to check or lubricate each day the weapon is fired or operated.

LUBRICANT-INTERVAL				INTERVAL-LUBRICANT		
Final Drive Fill and Level (See Note 1)	OE/HDO OEA	D	(C)	CLP	Cannon Bore (See Note 3)	(C)
				OE/HDO OEA	Transmission Fill and Level (See Note 4)	(C)
Gun Slide Rails (See Note 2)	GAA	D	(C)	OE/HDO OEA	Auxiliary Drive and Engine Crankcase (See Note 5)	(C)
				OHT	Hydraulic Reservoir (See Note 6)	(C)
Breechblock and Firing Mechanism (See Note 3)	CLP	D	(C)			
					Hydraulic Pump Pressure Filter (See Note 7)	(C)



DAILY NOTES (CONTINUED)

Note 1

FINAL DRIVE FILL AND LEVEL

Check oil level from outside vehicle F 11 plug access 15 under
transmission deck

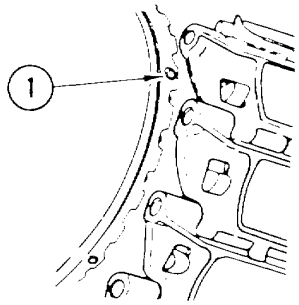
A Remove level check plug *(1)*

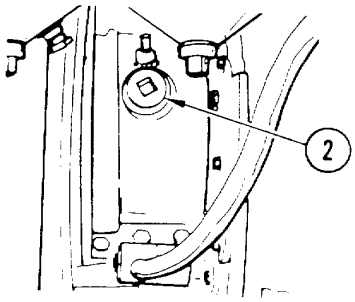
B Check that oil is level with bottom of opening . If not, remove transmission deck and remove; fill plug (2) in final drive saddle.

C Add oil (OE, HDO or OEA), slowly until oil flows from check plug (1) opening

D Clean level check plug (1) and fill plug (2) with solvent SD2 and
install.

E Repeat steps A through D for opposite side.

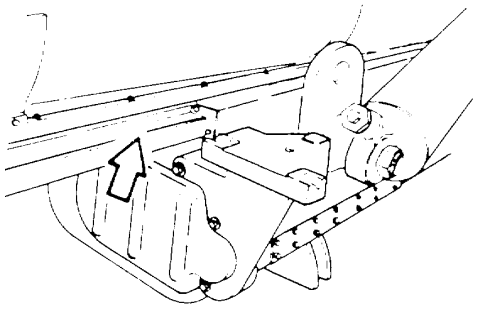




Note 2

GUN SLIDE RAILS

Clean with CLP and coat with GAA before and after firing.



DAILY NOTES (CONT

Note 3

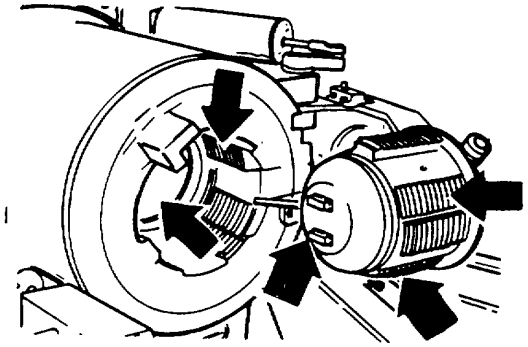
CANNON BORE, BREECH BLOCK, AND FIRING MECHANIST
Day of Firing:

A Cannon Tube:

1 Pour approximately 8 oz 1240 ml) of CLP on a bore brush and wet punch the tube once forward and once back.

2 Pour an additional 4 oz of CLP on the bore brush and scrub the entire length of the tube with a back and forth motion. Repeat this step as necessary.

3 Pour an additional 4 oz of CLP on the bore brush. Again wet punch the entire length of the tube, once forward and once back. Do not wipe dry.



B Breech and Muzzle Brake:

Note

Do not clean obturator pad with CLP. Use soap and water only.

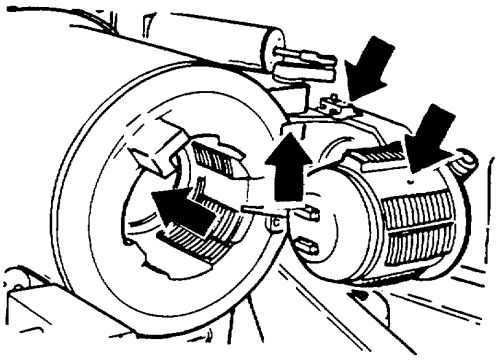
1 Remove and disassemble the M35 Firing Mechanism and Obturator Group.

2 Thoroughly wet all breech components with CLP and let soak for 10-15 minutes then brush or wipe dry. Reapply light coat of CLP to all breech surfaces.

3 Thoroughly wet the internal surfaces of the muzzle brake with CLP and let soak for 30-40 minutes. Wipe off and reapply a light coat of CLP.

4 Apply CLP to the primer vent and thoroughly brush with primer vent brush.

5 Thoroughly wet firing locks with CLP and wipe off all car bon and firing residue. Reapply a light coat of CLP.



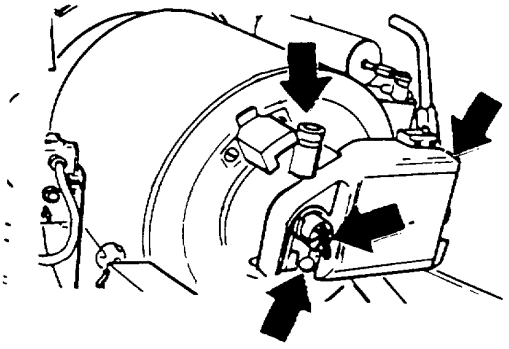
On Day After Firing:

1 Wet punch the tube following the procedures for day of firing.

2 Wrap the brush with a new disposable cleaning sleeve and dry punch the entire length of the tube once forward and back.

3 Wrap the brush with a new disposable cleaning sleeve and wet punch the entire length of the tube once forward and once back.

4 With new cleaning sleeve, repeat wet punching the tube at least two more times, or until tube is clean.



Note

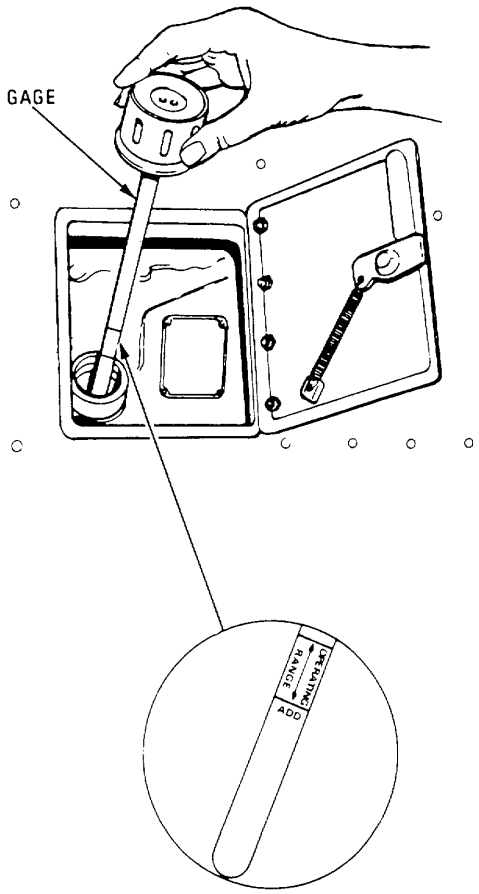
When weapon is not fired, clean and lubricate weekly with CLP. Wipe dry before firing.

DAILY NOTES (CONTINUED)

Note 4

TRANSMISSION FILL AND LEVEL

Access is through door in transmission deck



CAUTION

- Do NOT check oil with engine running-
- Do NOT overfill.

Note

Always think about oil temperature when adding oil The oil level will vary within OPERATING RANGE due to oil temperature.

A Check that oil level is within OPERATING RANGE on gage Do not add or drain oil if in this range Add oil only when below ADD mark.

B Add or drain oil (OEA or OE/HDO) as required. See Note 63 for drain procedures.

C Take oil sample every 25 hours of operation or every 60 days, whichever occurs first Refer to DA PAM 738-750 for sampling requirements

Note

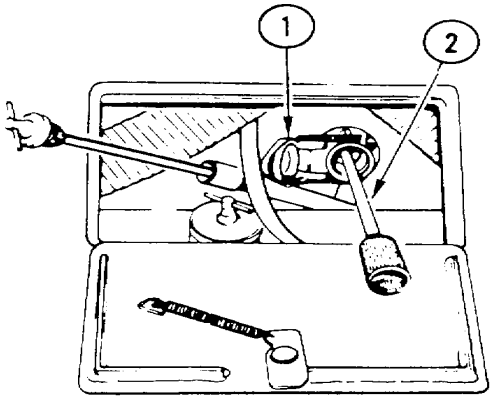
New transmissions are delivered with preservative oil MIL- L-21 260. Until first scheduled oil change, maintain proper oil level by adding OE/HDO or OEA.

DAILY NOTES, (CONTINUED)

Note 5

AUXILIARY DRIVE AND ENGINE CRANKCASE

Access is through door in engine deck.



A Auxiliary Drive

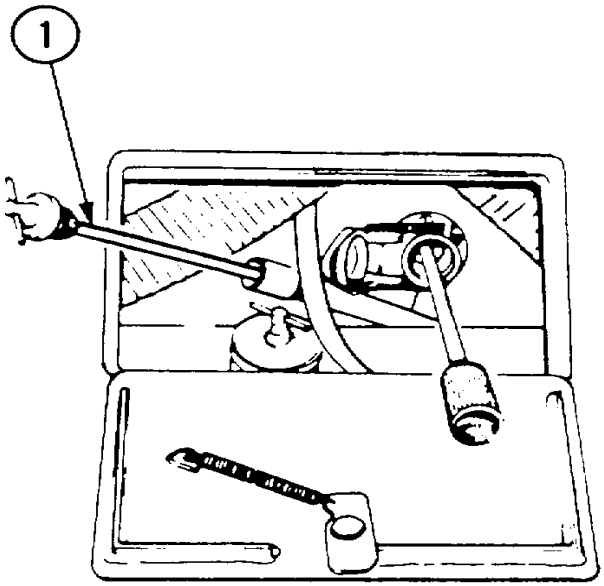
1 Lift cap (1) and check oil level. Oil level should be within FULL and ADD marks on gage (2).

2 Add or drain OE/HDO or OEA, as required.

B Engine Crankcase

Note

After overnight stand, oil level may indicate up to 3/4 in. (19 mm) over FULL mark. This is normal.



Step 1 deleted

2 Level should be between low (L) and full IF) marks on gage, (1). If required, add or drain oil (OE/HDO or OEA).

3 Take oil samples every 25 hours of operation or every 60 days, whichever occurs first. Refer to DA PAM 738-750 sampling requirements.

Note

New engines are delivered with preservative oil MIL-L-21260 (see DD Form 1397). Until first scheduled oil change, maintain proper level by adding OE/HDO or OEA as required for expected temperatures.

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DAILY NOTES (CONTINUED)

Note 6

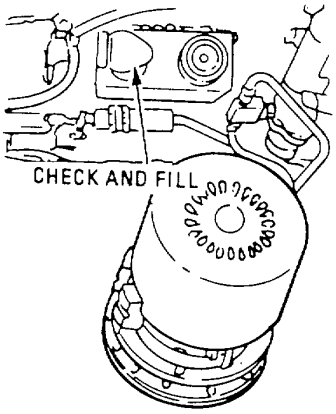
HYDRAULIC RESERVOIR

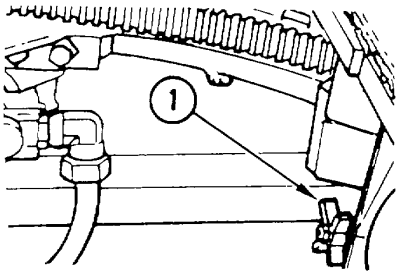
Check fluid level before operation.

A With cannon in battery, open pressure dumping valve 1) to allow hydraulic fluid to flow back into reservoir.

B Close pressure dumping valve 11)

C Fill reservoir with OHT to applicable FULL mark (spade raised or spade extended) on level gage.



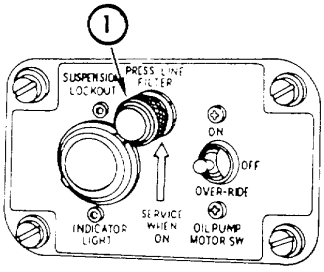


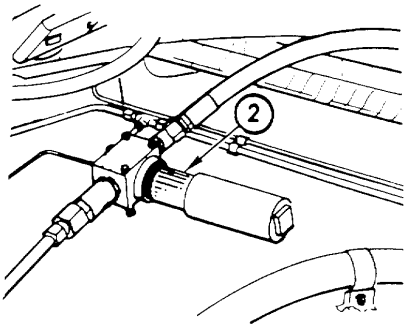
Note 7

HYDRAULIC PUMP PRESSURE FILTER

A Start hydraulic pump.

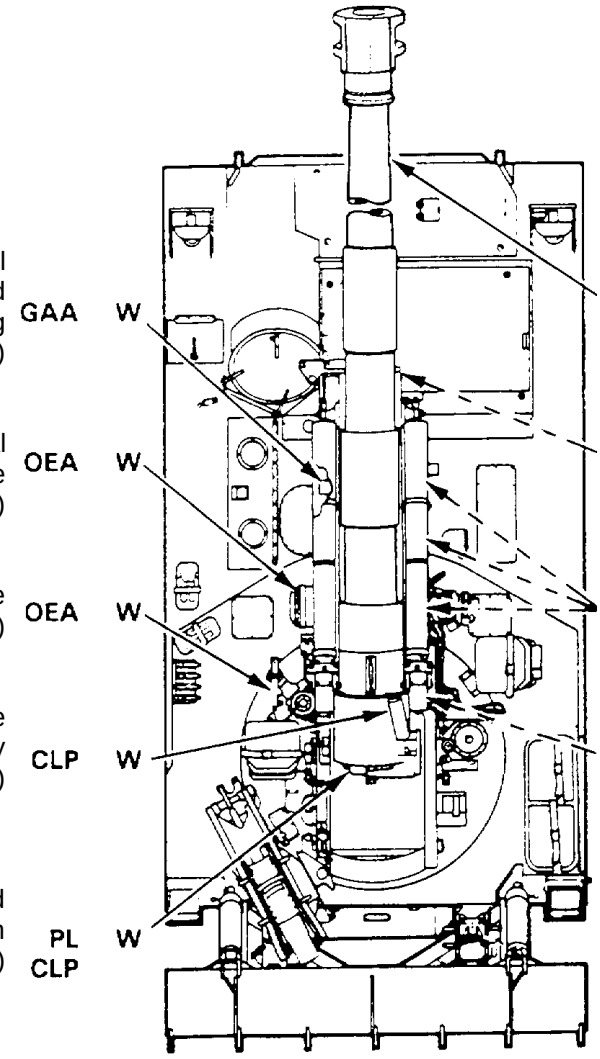
B Check indicator light (1) If it lights, the hydraulic pump pressure filter is dirty Remove, clean housing, and install new element (2).





WEEKLY NOTES

LUBRICANT-INTERVAL **INTERVAL-LUBRICANT**

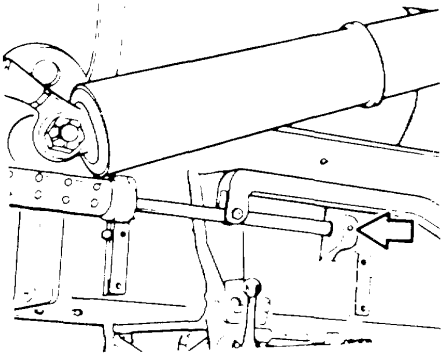


Variable Recoil Control Rod Bearing (See Note 8) (C)	GAA	W	W	CLP	Cannon Bore (See Note 1 2) (C)
Elevating Final Drive (See Note 9) (C)	OEA	W	W	CLP	Cradle Gun Bearing Rails (See Note 13) (C}
Traversing Drive (See Note 10) (C)	OEA	W	W	GAA	Gun Cradle Slides (See Note 14) (C}
Counterbalance Assembly (See Note 11) (C)	CLP	W	W	CLP	Equilibrator Adjusting Screws And Guide Liners (See Note 51 {C}
Breechblock and Firing Mechanism (See Note 12) (C)	PL CLP	W			

Note 8

VARIABLE RECOIL CONTROL ROD BEARING

Lubricate fitting with GAA.



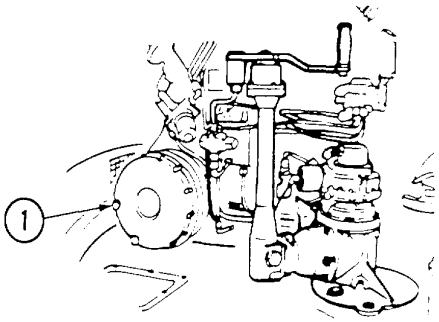
Note 9

ELEVATING FINAL DRIVE

A Remove fill and level plug 111.

B Fill to bottom of level hole with OEA

C Clean with CLP and install fill and level plug



Note 10

TRAVERSING DRIVE

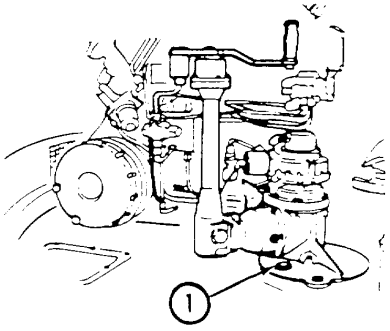
A Remove fill plug (1).

B Check level.

C Fill with OEA to 2 ½ in (6 4 cm} from top of filler plug hole.

D Initial fill 3 quarts (2 . 8 1).

E Clean fill plug with CLP and install.

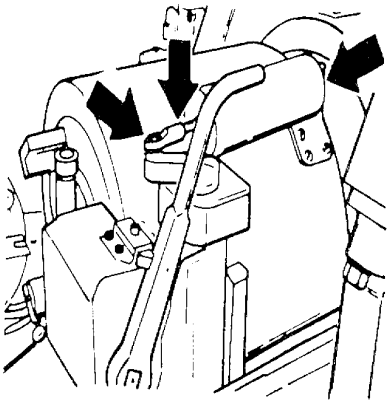


Note 11

COUNTERBALANCE ASSEMBLY

A Apply a couple of drops of CLP as indicated.

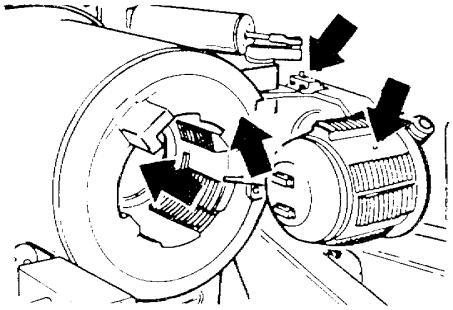
B Extend and lube piston rod with CLP



Note 12

CANNON BORE, BREECHBLOCK, AND FIRING MECHANISM

When cannon is not being fired



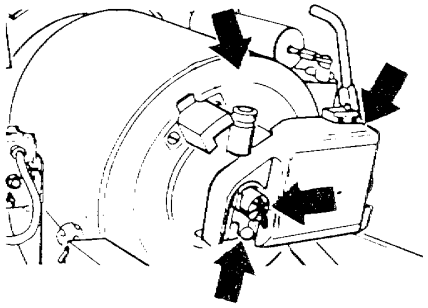
A Clean with CLP and wipe dry

B Coat with CLP Wipe clean before firing

OR

C Inspect cannon bore for cleanliness and corrosion If ret dry punch bore with clean wiping rag, then wet-punch with wiping rags soaked in CLP

D Apply CLP as indicated



Note

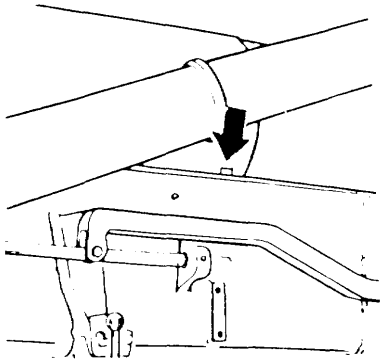
Do not clean obturator pad with CLP Use soap and water only.

WEEKLY NOTES (CONTINUED)

Note 13

CRADLE GUN BEARING RAILS

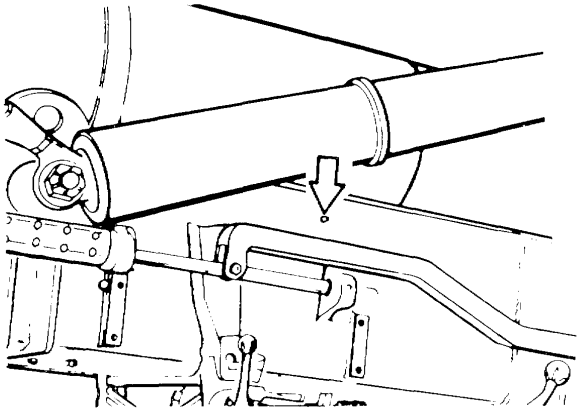
Lubricate eight oil cups with CLP (four on each side)



Note 14

GUN CRADLE SLIDES

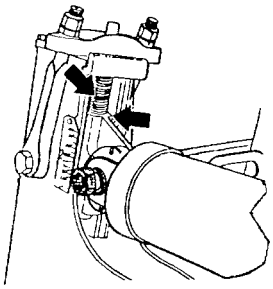
Lubricate six fittings with GAA (three on each side)



Note 15

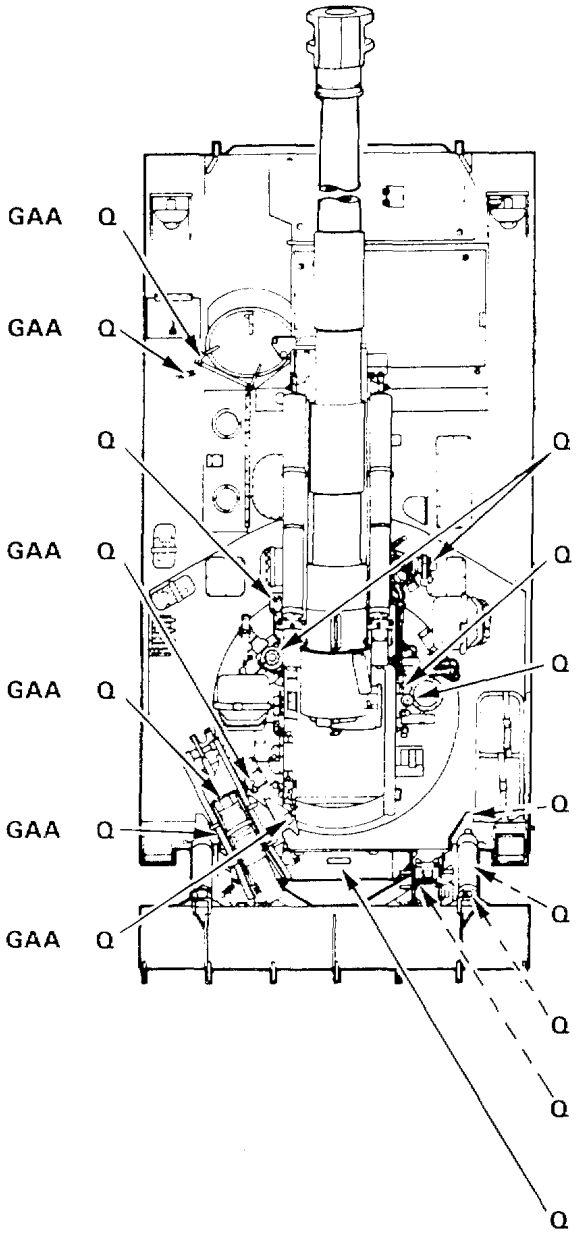
EQUILIBRATOR ADJUSTING SCREWS AND GUIDE LINERS

Clean and oil with CLP.



QUARTERLY NOTES

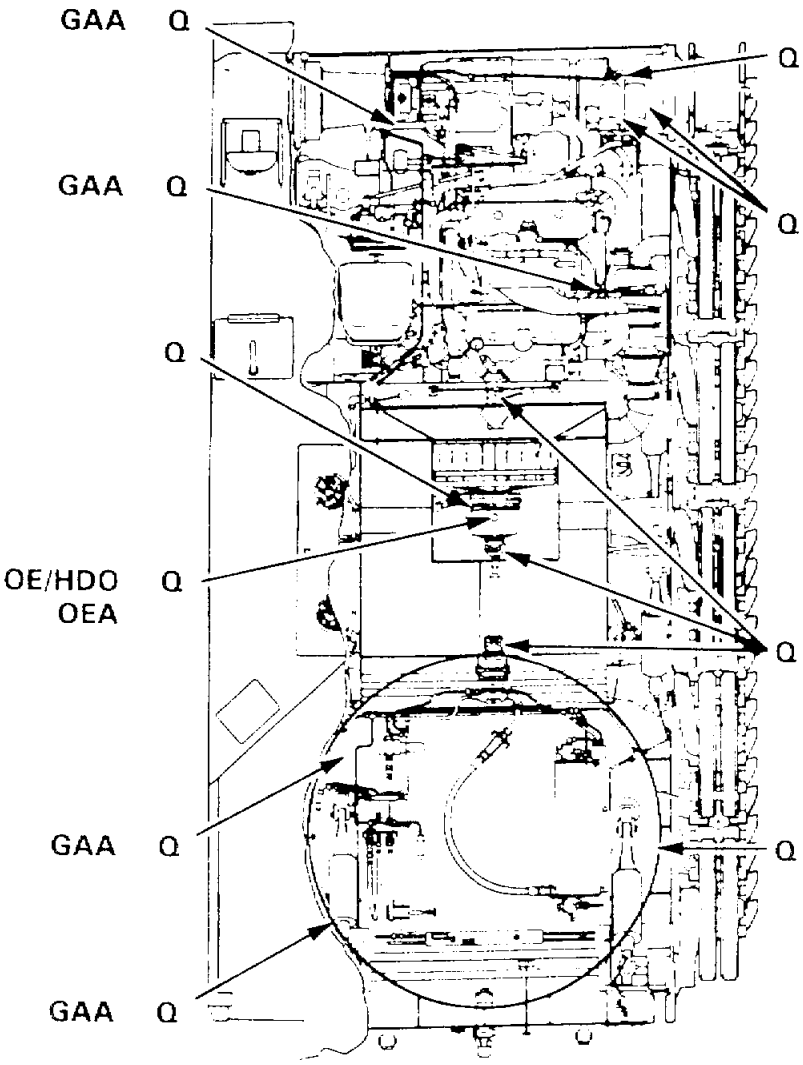
LUBRICANT-INTERVAL **INTERVAL-LUBRICANT**



LUBRICANT-INTERVAL			INTERVAL-LUBRICANT	
Cupola Cove Torsion Bar {See Note 16) (0)	GAA	Q		
Cupola Cove Hold Open Lock (See Note 17) (0)	GAA	Q		
Gun Recoil Mechanism Filter (See Note 18) (0)		Q	Q	OHT
Rammer Chain Sprocket, and Trough (See Note 19) (0)	GAA	Q	Q	Torque Lock (Old) Drive Assembly See Note 23) (F) Hydraulic Supply Pressure Filter See Note 251 (0) Hydraulic Reservoir Breather and Filter Screen See Note 24) (0)
Rammer Gear case Drive Head Shaft Slide Gear (See Note 20) (0)	GAA	Q	Q	
Rammer Cylinder Rack (See Note 21) (0)	GAA	Q	Q	GAA Trailing Idler Wheel Arm Bearings See Note 26) (0)
Loader-Rammer Pivot Arm Bearings (See Note 22) (0)	GAA	Q	Q	GAA Spade Lifting Cylinder Bearings See Note 27) (0)
			Q	GAA Spade Hinge Pins See Note 28) (0)
			Q	GAA Shell Rack Chain Assembly See Note 29) (0)
			Q	GAA Towing Pintle See Note 30) (0)

QUARTERLY NOTES

LUBRICANT-INTERVAL **INTERVAL-LUBRICANT**



Brake Control Shaft (See Note 31) (0)

Tachometer Cable Adapter (See Note 32) (0)

Auxiliary Drive Clutch Housing Breather (See Note 33) (0)

Auxiliary Drive Clutch Oil Level and Fill (See Note 33) (0)

Traversing Final Drive Bearings (See Note 34) (0)

Traversing Ring Gear (See Note 35) (0)

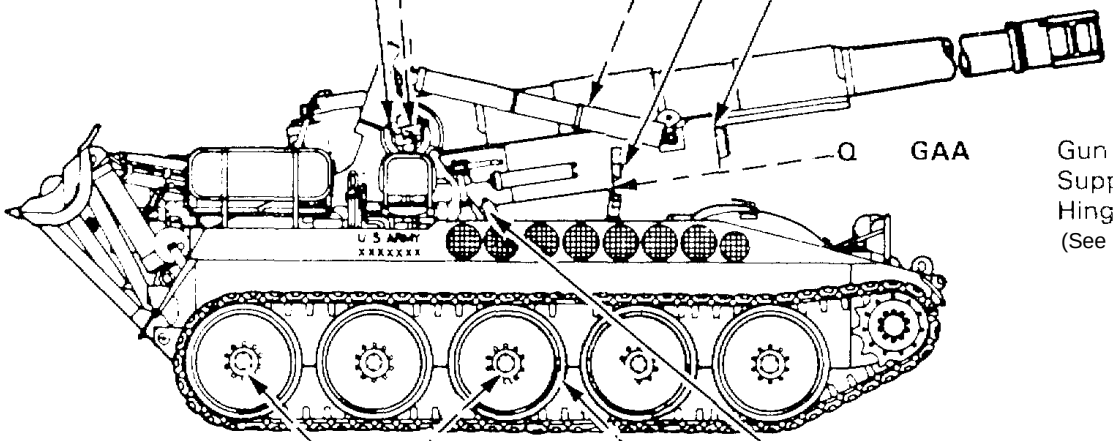
GAA Speedometer Cable Adapter (See Note 36) (0)

Engine Oil Filters (See Note 37) (0)

Universal Joints (See Note 38) (0)

GAA Turret Bearing See Note 39) (0)

QUATERLY NOTES (CONTINUED)



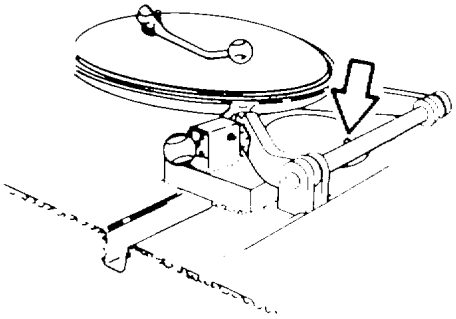
LUBRICANT-INTERVAL			INTERVAL-LUBRICANT		
Gun Mount Trunnion Bearings (See Note 40)	GAA	Q (O)	Q	CLP GAA	Equilibrator Assembly (See Note 43) Q (O)
Rammer Traversing Cylinder Assembly (Left Side) (See Note 41)	GAA	Q O)	Q	GAA	Variable Recoil Control Rod (Left Side) (See Note 44) Q (O)
			Q	GAA	Recoil Cylinder Gear and Segment (See Note 45) Q (O)
			Q	GAA	Gun Travel Support Hinge Pins (See Note 46) Q (O)
Road Wheel and Trailing Idler Hub Bearings (See Note 42)	OE/HDO OEA GAA	Q (O)	Q	GAA	Gun Elevation Final Drive Gear and Pinion (See Note 47) Q (O)
			Q	GAA	Road Wheel Arm Bearings (See Note 48) Q (O)

QUARTERLY NOTES (CONTINUED)

Note 16

CUPOLA COVER TORSION BAR

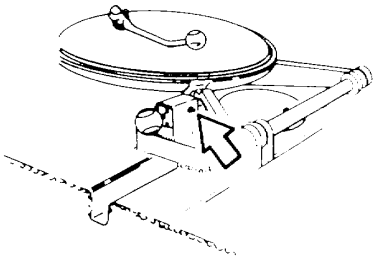
Lubricate fitting with GAA



Note 17

CUPOLA COVER HOLD OPEN LOCK

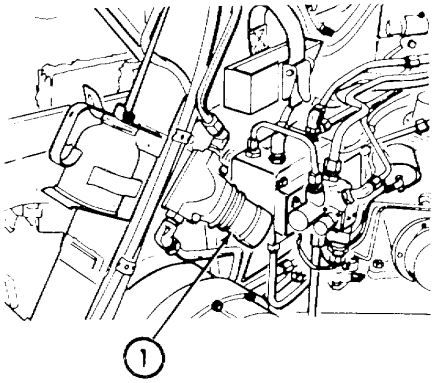
Lubricate fitting with GAA.



Note 18

GUN RECOIL MECHANISM FILTER

Remove element (1) and clean case with solver SD2. Install new element

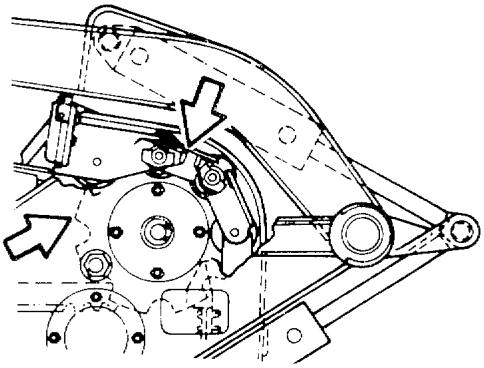


QUARTERLY NOTES (CONTINUED0

Note 19

RAMMER CHAIN, SPROCKET, AND TROUGH

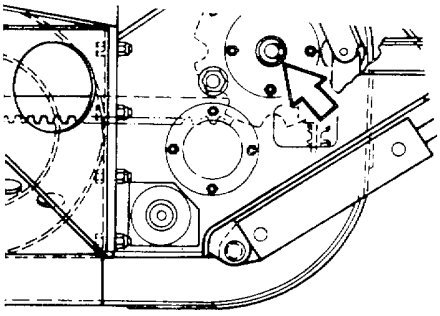
Clean with CLP and coat with GAA.



Note 20

RAMMER GEARCASE DRIVE HEAD SHAFT SLIDE GEAR

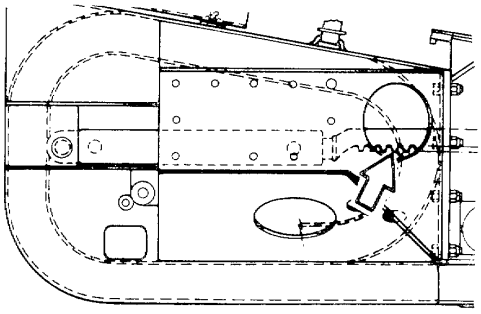
Access through headlink opening Clean and lubricate with GAA.



Note 21

RAMMER CYLINDER RACK

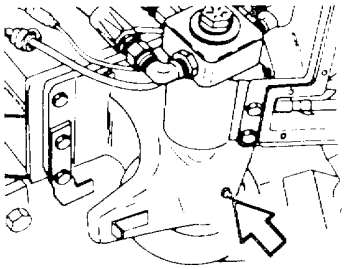
Clean with CLP and lubricate with GAA



Note 22

LOADER-RAMMER PIVOT ARM BEARINGS

Lubricate fitting with GAA until grease can be seen at top Lift seal to observe when grease comes out.



Note 23

TORQUE LOCK DRIVE ASSEMBLY

Quarterly, notify direct support to remove, service, and install torque lock handcrank drive assemblies, Fill assembly with oil, OHT, up to bottom of fill hole in flange.

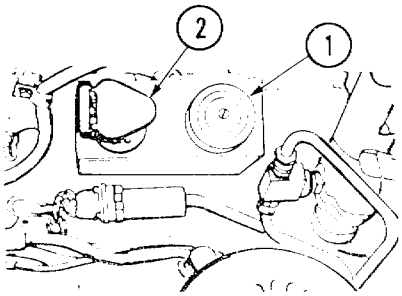
Note 24

HYDRAULIC RESERVOIR BREATHER AND FILTER SCREEN

A Service every 750 ml 1’207 km) or quarterly, whichever occurs first.

B Remove breather (1) and filter screen 2 and clean with solvent SD2

C For desert or very dusty conditions, clean daily.

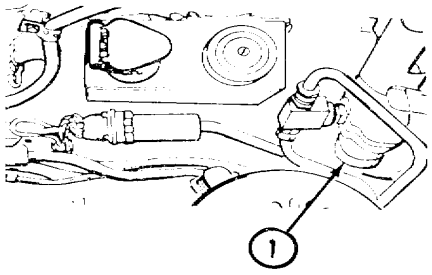


Note 25

HYDRAULIC SUPPLY PRESSURE FILTER

A Service every 750 mi (1207 km) or quarterly, whichever occurs first.

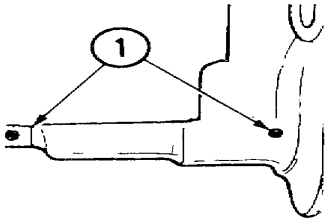
B Remove element (1) and clean case with solvent SD2 Install new element and gaskets.



Note 26

TRAILING IDLER WHEEL ARM BEARINGS

Note
Pump grease gun 5 or 6 times to properly lubricate bearings.

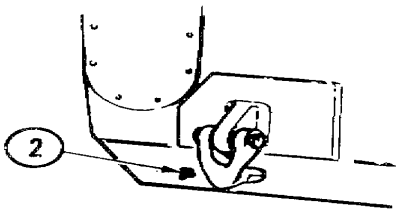


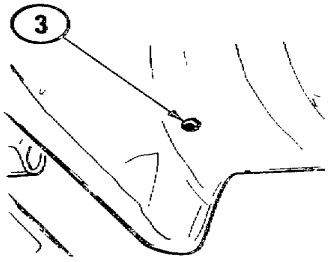
Lubricate with GAA.

A Lubricate two right arm bearing fittings 11).

B Lubricate left arm inner bearing fitting (2) from rear of vehicle.

C Lubricate left arm outer bearing fitting (3).

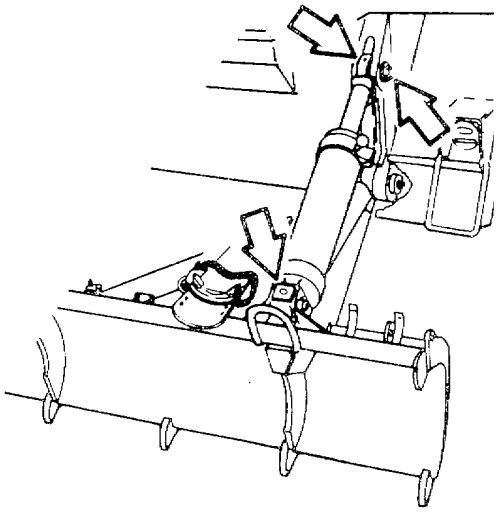




Note 27

SPADE LIFTING CYLINDER BEARINGS

Lubricate three fittings on each cylinder with GAA..

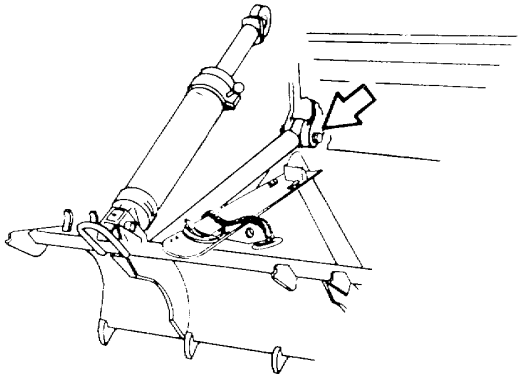


QUARTERLY NOTES (CONTINUED)

Note 28

SPADE HINGE PINS

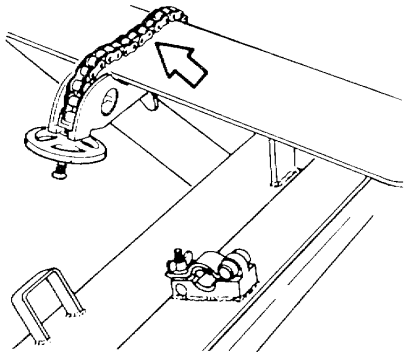
Lubricate two fittings with GAA



Note 29

SHELL RACK CHAIN ASSEMBLY

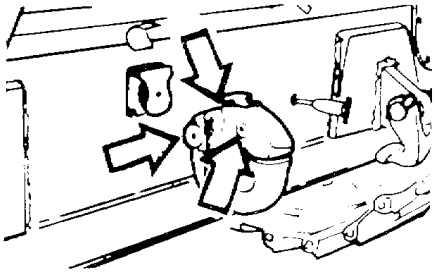
Clean with CLP and coat with GAA.



Note 30

TOWING PINTLE

Lubricate three fittings with GAA.



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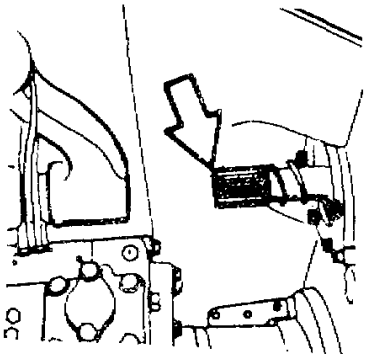
Note 31

BRAKE CONTROL SHAFT

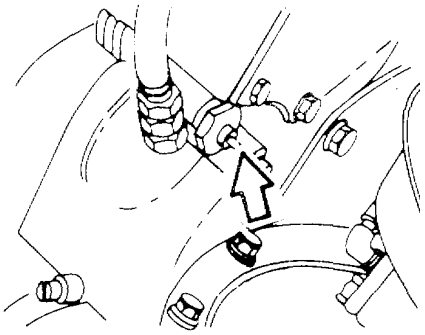


A Service at time of powerplant removal.

B Clean with CLP and coat splines with CAA.

Note 32

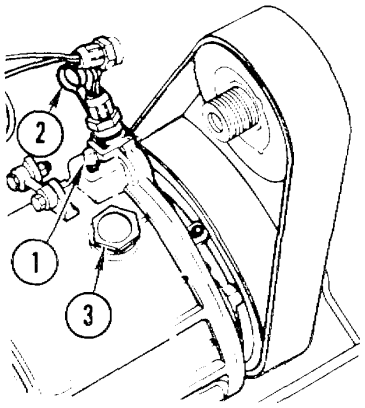
TACHOMETER CABLE ADAPTER



Lubricate fitting sparingly with GAA..

Note 33

AUXILIARY DRIVE CLUTCH HOUSING BREATHER, OIL LEVEL, AND FILL



Clear. breather and check oil level.

A Remove breather 111, clean with solvent SD2 and install.

B Check that oil level is at FULL mark on gage (2i.

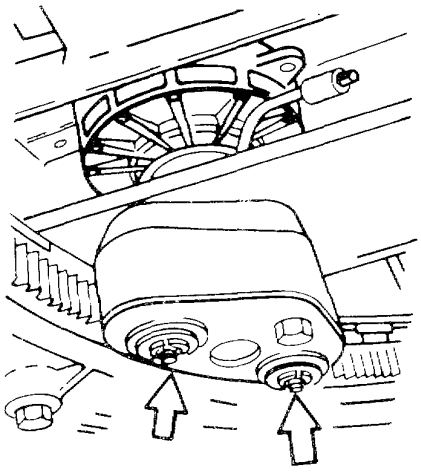
C Remove fill plug (3) and fill with oil (OE/HDO or OEA) as necessary

D Rae Clean fill plug (3) with solvent SD2 and install.

Note 34

TRAVERSING FINAL DRIVE BEARINGS

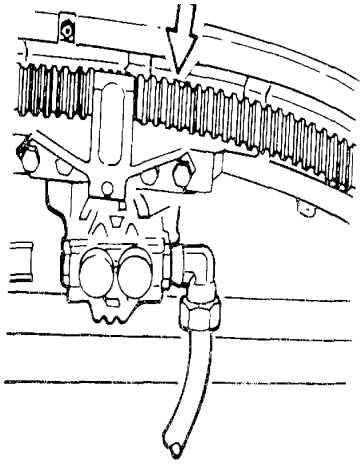
Lubricate two bearings with GAA.



Note 35

TRAVERSING RING GEAR

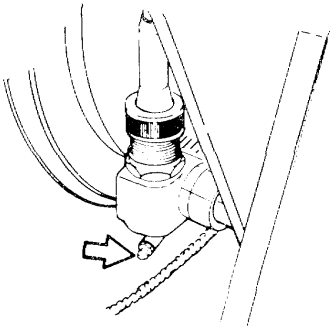
Clean with CLP and coat with GAA.



Note 36

SPEEDOMETER CABLE ADAPTER

Lubricate fitting sparingly with GAA.



Note 37

ENGINE OIL FILTERS

Replace both filter elements quarterly, every 750 mi (1207 km), every 75 hr, or when engine oil is drained.

Note

The following steps are written for one engine oil filter but apply to both.

A Remove drain plug (1) and drain oil into a suitable container.

B Loosen shoulder bolt (2) and remove shell (3), filter element (4), and gasket (5).

C Discard filter element and gasket.

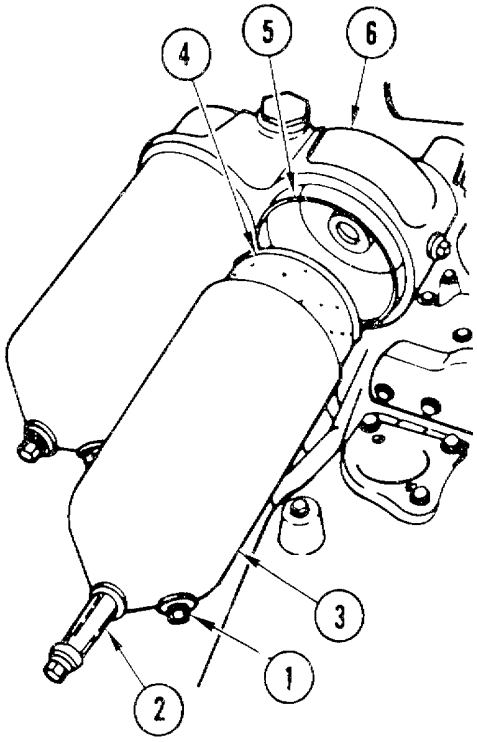
D Clean plug 11) and shell (3) with solvent SD2, dry thoroughly, and install drain plug (11 in shell (3).

E Place new gasket (5) in adapter (6) and press into place.

F Place new filter element in shell (3) and install shell (3) on adapter (6) with drain plug (1) down.

G Tighten shoulder bolt (2) securely and run engine for a few minutes.

H Shut off engine and check oil level. Add oil as necessary (see Note 5).



Note 38

UNIVERSAL JOINTS

Note

Power plant does not need to be removed to lubricate universal joints.

Lubricate four fittings with GAA. Wipe off extra lubricant.

To lube carrier bearing universal joint:

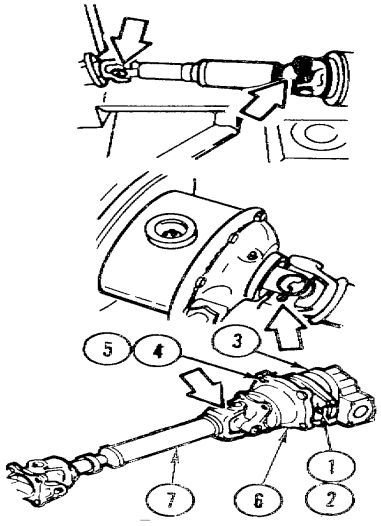
A Remove lockwire I1), two screws (2), and rotary pump 13).

B Remove lockwire (4) and four screws (5) securing carrier bearing (6).

C Pull carrier bearing (6) and drive shaft (7) just far enough into turret well to lube fitting with GAA.

D Push carrier bearing (6) and rotary pump i3) together.

E Install four screws (5) and lockwire (4) to carrier bearing (6) and two screws (2) and lockwire (1) to rotary pump (3)

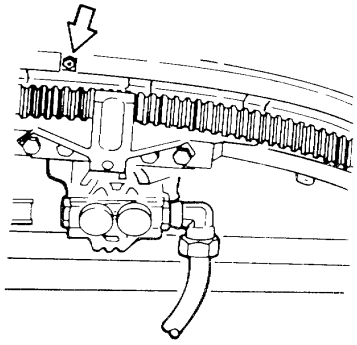


QUARTERLY NOTES (CONTINUED)

Note 39

TURRET BEARING

Lubricate quarterly or after cleaning bearing or turret well with steam or high-pressure water



A Lube fittings (forward and rear) with CAA until clean grease I observed at seals.

B Traverse cannot by hand to the right and left while applying grease.

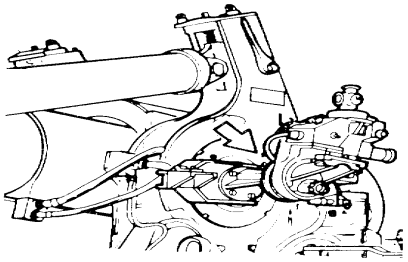
C Wipe dirty grease from seals

D Repeat steps A through C until only clean grease comes out from seals.

Note 40

GUN MOUNT TRUNNION BEARINGS

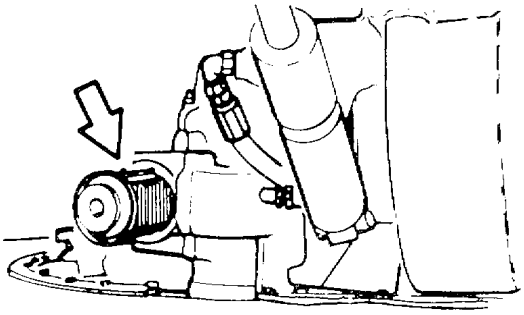
Lubricate two fittings (ore on each side) with GAA until grease appears at relief fitting



Note 41

RAMMER TRAVERSING CYLINDER ASSEMBLY

Clean with CLP and coat with GAA.



Note 42

ROAD WHEEL AND TRAILING IDLER HUB BEARINGS

Note

Two types of hubs are used on road wheels and trailing idler wheels. One type uses oil (OE/HDO or OEA) for lubrication, the other type uses grease (GAA) for lubrication. Check the road wheel hubs and idler wheel hubs on your vehicle before lubricating

A Oil Filled Hubs ("O" Vehicles)

Check oil level.

1 Place vehicle on level ground.

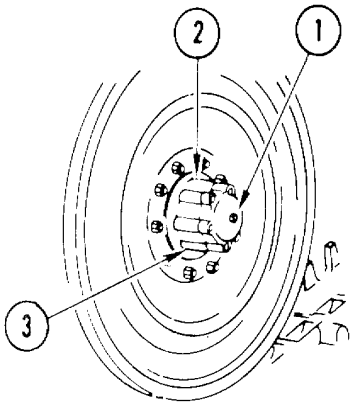
2 Remove check plug (1) and observe that oil is level with bottom of hole. Fill if necessary (steps 3 thru 6).

3 Rotate wheel until fill plug 121 and drain plug 131 are about vertical.

4 Clean area and remove fill plug 12).

5 Fill to bottom of level hole with oil (OE/HDO or OEA). Allow time for oil to reach oil cavities.

6 Clean check plug 11 M and fill plug (21 with solvent SD2 and install.

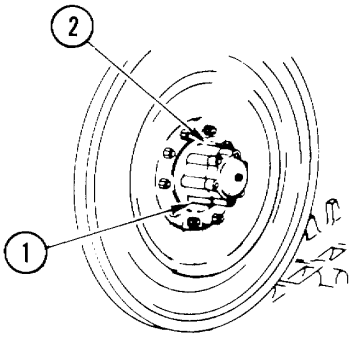


OIL FILLED HUBS

B Grease Filled Hubs ("N" Vehicles)

Lubricate with GAA.

Lubricate fitting (1) with GAA until grease comes out of safety relief valve (2)



GREASE FILLED HUBS

QUARTERLY NOTES (CONTINUED)

Note 43

EQUILIBRATOR ASSEMBLY

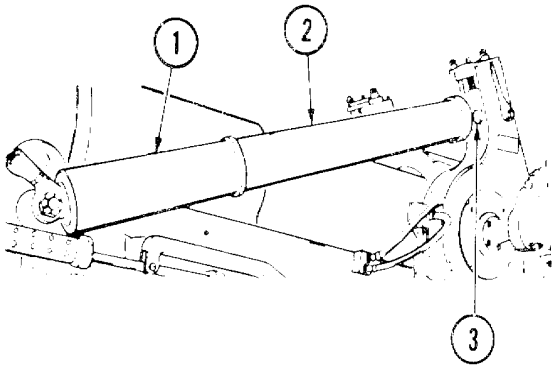
A Depress cannon to depression stops.

B Unscrew cover 91) from front of equilibrator and slide to rear.

C Wipe dry and apply a thin coat of CLP to all parts, including outer surface of plunger (2) and case

D Slide cover forward and secure

E Lubricate fitting 31S on equilibrator mount bolts sparingly with GAA



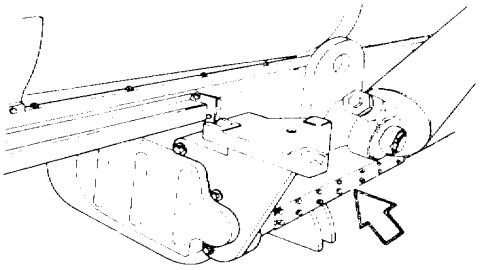
Note 44

VARIABLE RECOIL CONTROL ROD

A Remove cover.

B Clean and coat rod and control cams with GAA.

C Clean with CLP and install cover



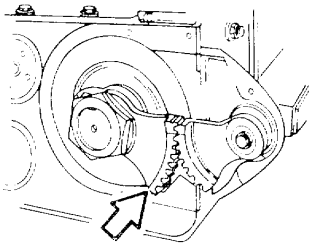
Note 45

RECOIL CYLINDER GEAR AND SEGMENT

A Remove eight screws, lockwashers, washers, cover, and bracket

B Coat gear and segment with GAA.

C Clean with CLP and install cover



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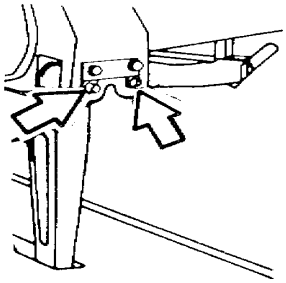
QUARTERLY NOTES (CONTINUED)

Note 46

GUN TRAVEL SUPPORT HINGE PINS

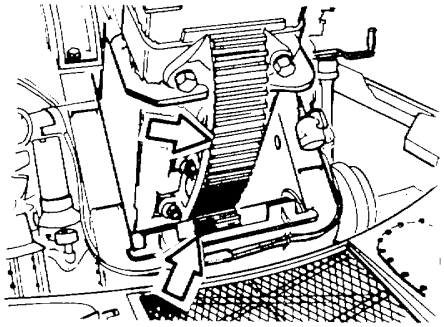
Lubricate four fittings with GAA.



Note 47

GUN ELEVATION FINAL DRIVE GEAR AND PINION

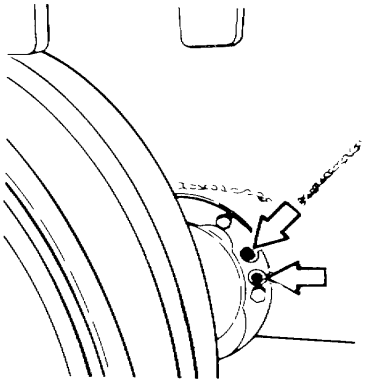
Clean with CLP and coat with GAA



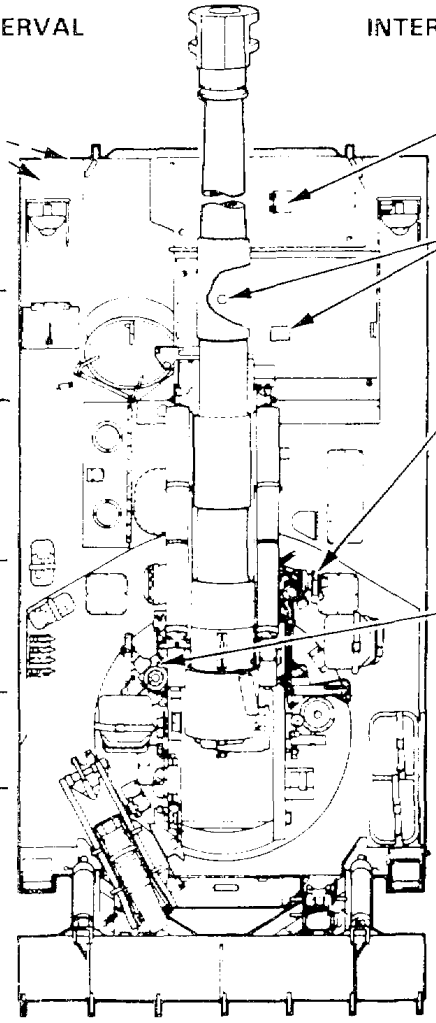
Note 48

ROAD WHEEL ARM BEARINGS

Lubricate road wheel arm bearings weekly with GAA when operating in muddy or rough environ- ment Lubricate quarterly, or every 750 mi (1207 km), during normal operation.



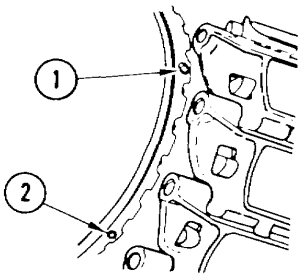
SEMIANNUAL NOTES



LUBRICANT-INTERVAL			INTERVAL-LUBRICANT		
Final Drive Drain and Fill (See Note 49) (O)	OE/HDO OEA	S	S		Final Drive Breathers (See Note 51) (O)
			S	OE/HDO OEA	Auxiliary Drive Drain and Fill (See Note 52) (O)
Road Wheel and Idler Wheel Hub Bearings Drain and Fill Oil Filter Hubs (See Note 50) (O)	OE/HDO OEA	S	S	GAA	Elevating Column and Breather (See Note 53) (O)
			S	GAA	Traversing Drive Assembly (See Note 54) (O)
					Transmission Oil Filter (See Note 55) (O)

Note 49

FINAL DRIVE DRAIN AND FILL

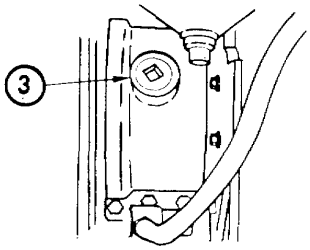


WARNING
Oil will be hot after operation

Drain oil from both final drives

Note

Drain only after operation



A Remove level plug (1) and drain plug 12) and drain oil into a suitable container.

B Clean drain plug !21 with solvent SD2 and install.

C Remove fill plug 131 in final drive saddle

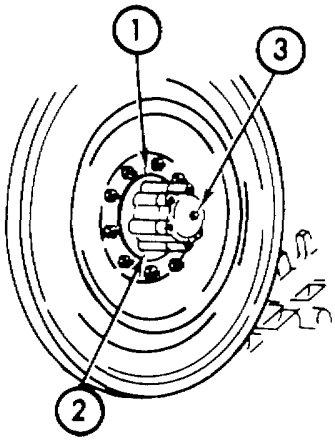
D Slowly add oil IOEI/HDO or OEA) through fill plug hole 131 until oil flows from level plug hole A1i

E Clean plugs (1) and Si3 with solvent SD2 and install.

F Repeat steps A through E for other side

Note 50

ROAD WHEEL AND IDLER WHEEL HUB BEARINGS DRAIN AND FILL



Drain every 1500 mi 12414 km) or semiannually, whichever occurs first

A Rotate wheel until fill plug 11 and drain plug !21 are about vertical.

B Remove check plug i3) and drain plug 121 and drain oil into a suitable container

C Clean drain plug 121 with solvent SD2 and install

D Clean area and remove fill plug (1).

E Fill to bottom of level hole with oil (GOEHDO or OEA) Allow time for oil to reach oil cavities

F Clean check plug !3! and fill plug 11 ! with solvent SD2 and install.

Note 51

FINAL DRIVE BREATHERS

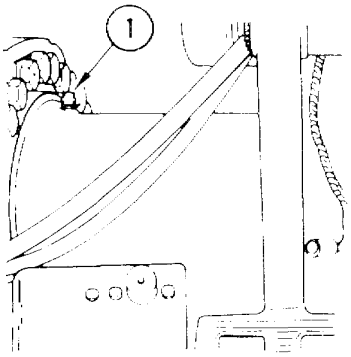
WARNING

Brake pedal is spring loaded Before working in driver's compartment, block vehicle tracks and release parking brake.

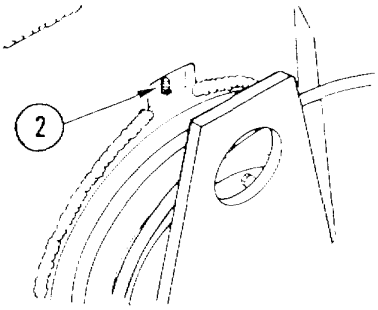
Access to LH final drive breather (1) Is through driver's compartment. Access to RH final drive breather (2) is through transmission deck.

A Remove breathers (1) and (2) and clean with solvent SD2.

B Dip in oil IOE/HDO or OEA) and install



LH FINAL DRIVE BREATHER



RH FINAL DRIVE BREATHER

Note 52

AUXILIARY DRIVE DRAIN AND FILL

WARNING
Oil will be hot after operation.

Note
Drain only after operation

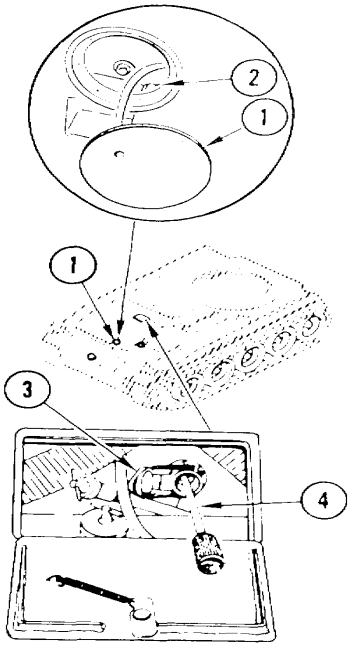
A Remove engine crankcase drain cover 1) from bottom of hull

B Remove auxiliary drive drain cap (2) and drain oil into a suitable container.

C After draining, clean auxiliary drive drain cap (2) with solvent SD2 and install drain cap and engine crankcase drain cover 11l

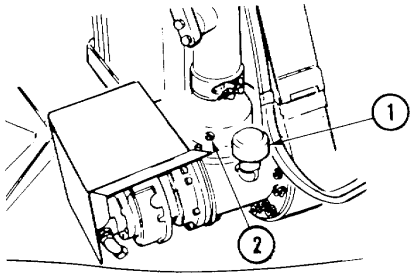
D Open fill cap (3). Fill with oil (OE/HDO or OEA) until oil level is within FULL and ADD marks on gage (4).

E Clean and close fill cap !31.



Note 53

ELEVATING COLUMN AND BREATHER

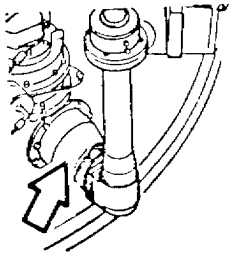


A Remove breather (1), clean in solvent SD2, and install

B Lubricate fitting (2) sparingly with GAA

Note 54

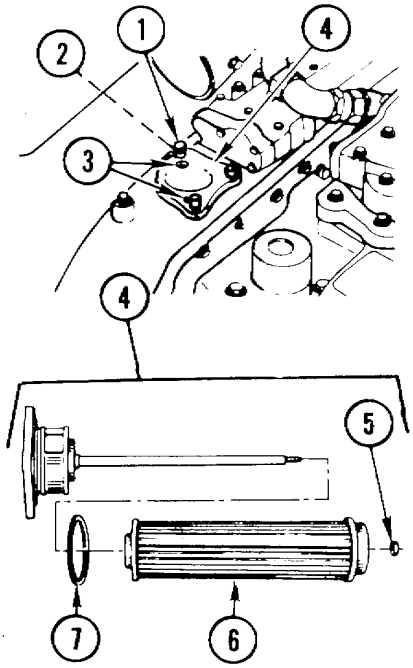
TRAVERSING DRIVE ASSEMBLY



Lubricate fitting sparingly with GAA.

Note 55

TRANSMISSION OIL FILTER



Replace filter element every 1500 mi (2414 km), every 150 hr, semiannually, whichever occurs first, and each time the transmission oil is drained

A Remove three screws (1) and three washers (2).

B Install two screws (1) in jack screw holes (3).

C Tighten screws (1) until filter assembly (4) is loose and remove filter and screws (1)

D Remove nut (5), element (6), and packing (7) Discard element and packing

E Clean parts with solvent SD2 and allow to dry thoroughly.

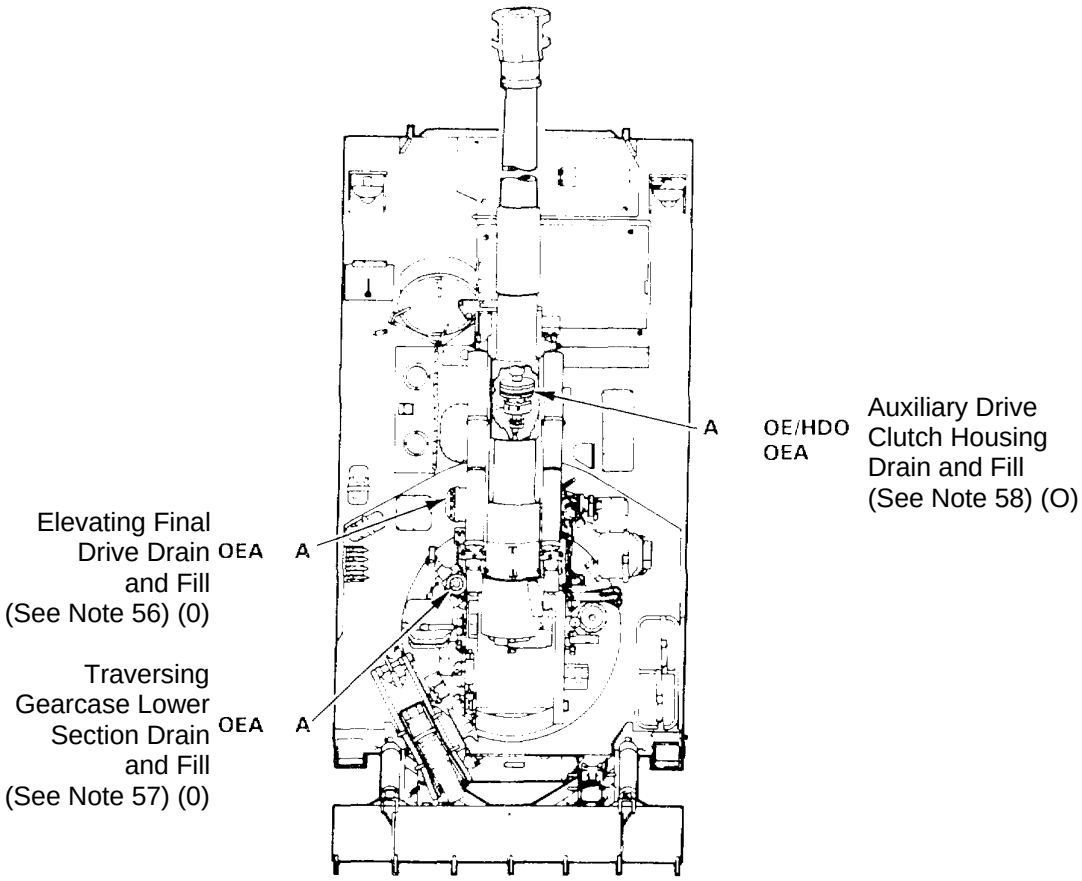
F Install new packing (7), new element (6), and nut (5).

G Install filter assembly (4), using three washers (2) and three screws (1).

H Run engine and shift transmission several times to check for leaks.

ANNUAL NOTES

LUBRICANT-INTERVAL **INTERVAL-LUBRICANT**



Note 56

ELEVATING FINAL DRIVE DRAIN AND FILL

A Remove fill and level plug (1i and drain plug (21

B After draining, clean drain plug 12) with solvent SD2 and install.

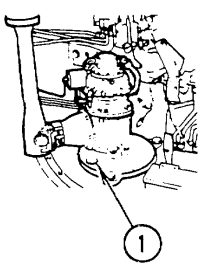
C Refill to bottom of level hole with OEA

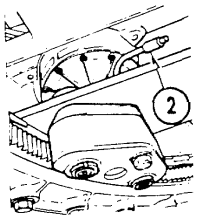
D Clean and install fill and level plug (1)

ANNUAL NOTES (CONTINUED)

Note 57

TRAVERSING GEARCASE LOWER SECTION DRAIN AND FILL





A Remove fill plug (1) and drain plug (2).

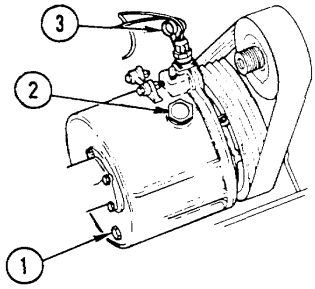
B After draining, clean drain plug (2) with solvent SD2 and install.

C Refill with OEA. Clean and install fill plug (1).

D Initial fill 3 quarts (2 8 !).

Note 58

AUXILIARY DRIVE CLUTCH : OUSING DRAIN AND FILL



Drain oil from clutch housing.

A Remove drain plug 11) and drain oil into a suitable container.

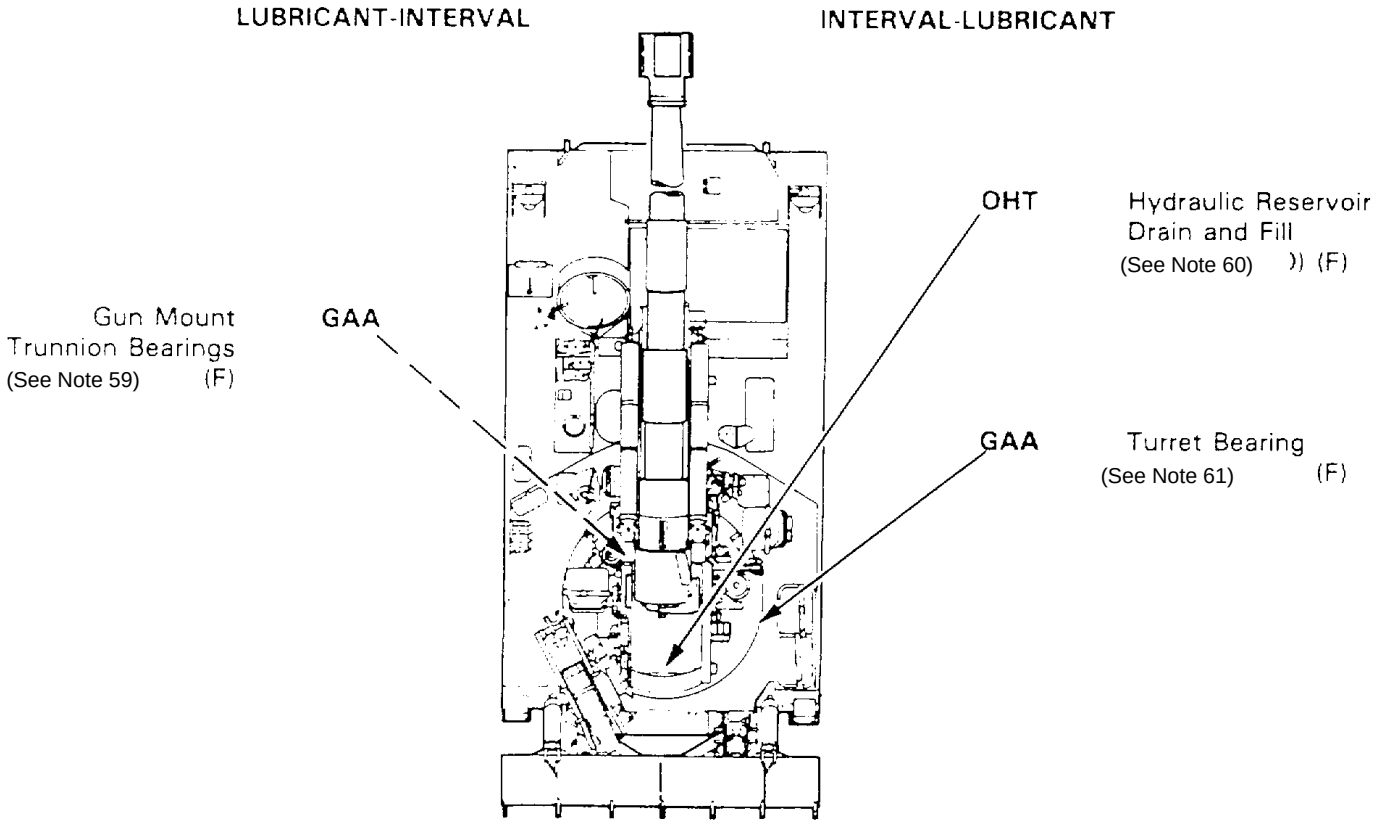
B Clean drain plug (1) with solvent SD2 and install.

C Remove fill plug (2) and add oil (OE/HDO or OEA) to full mark on gage (3).

D Clean fill plug (2) with solvent SD2 and install.

LO 9-2350-304-12

18 MONTH SERVICE



Note 59

GUN MOUNT TRUNNION BEARINGS

Notify direct support maintenance to remove. Disassemble and clean trunnion caps and bearings with- solvent SD2. Repack bearing with GAA and reinstall Replace oil seal

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Note 60

HYDRAULIC RESERVOIR DRAIN AND FILL

Notify direct support maintenance to drain and fill hydraulic reservoir with OHT to applicable full mark spade raised or spade extended) on level gage Capacity 27 gal (102 2 !).

Note 61

TURRET BEARING

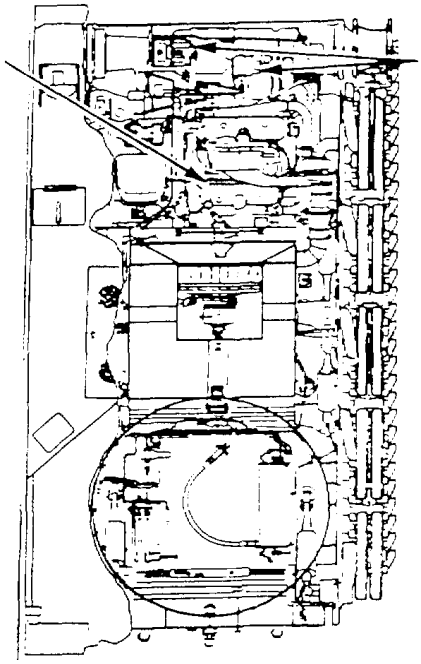
Notify direct support maintenance to remove. Disassemble and clean turret bearing with solvent SD2 Lubricate with GAA while rotating the outer race at least two complete turns to be sure bearing is packed with grease capacity 41 lb !18 6 kg)

ON-CONDITION NOTES

LUBRICANT-INTERVAL

INTERVAL-LUBRICANT

Engine Crankcase Drain (See Note 62) OE/HDO OEA (O) OC



OC OEA Transmission Fill and Drain (See Note 63) (O)

Note 62

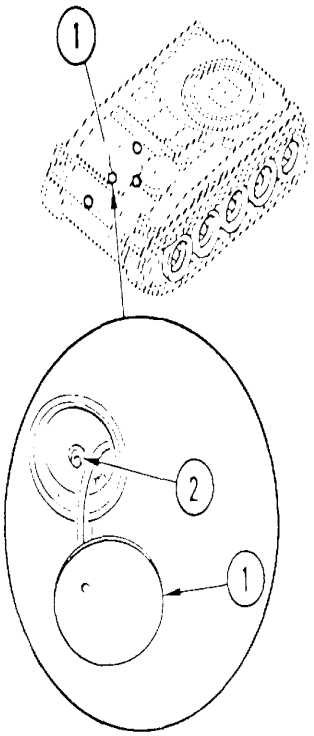
ENGINE CRANKCASE DRAIN

WARNING

Oil will be hot after operation.

Note

Drain only after operation



Drain when notified by the Army Oil Analysis Program (AOAP) laboratory.

If AOAP laboratory support is not available, drain every 1 500 mi (2414 km), 1 50 hr, or semiannually, whichever occurs first. If OEA is used, drain every 750 mi (1207 km), 75 hr, or quarterly, whichever occurs first.

A Move vehicle to level ground.

B Remove cover (1) from bottom of hull and remove drain plug 12) from engine.

C Drain oil into a suitable container.

D Clean drain plug (2) with solvent SD2 and install drain plug (2) and cover (1).

E Replace oil filter elements {see Note 37).

F Refill engine crankcase (see Note 5).

Note 63

TRANSMISSION DRAIN AND FILL

WARNING

Oil will be hot after operation.

Drain when notified by the Army Oil Analysis Program IAOAP) laboratory.

If AOAP laboratory support is not available, drain every 1500 mi (2414 km!, 150 hr, or semiannually, whichever occurs first If OEA or OE HDO is used, drain every 750 mi (1207 km), 75 hr, or quarterly, whichever occurs first Drain only after operation

A Move vehicle to level ground

B Remove transmission drain access cover (I) from bottom of hull, remove transmission drain plug (2) from transmission, and drain oil into a suitable container.

C Clean transmission drain plug !2) with solvent SD2 and install drain plug and access cover 11)

D Replace transmission oil filter (see Note 55).

E Add oil (OEA or OE/HDO) at transmission fill (3i until Oil level is within OPERATING RANGE on gage (4)

F After filling, run engine at 1 600 to 1 900 rpm with brakes applied and transmission in fourth gear to vvarm oil.

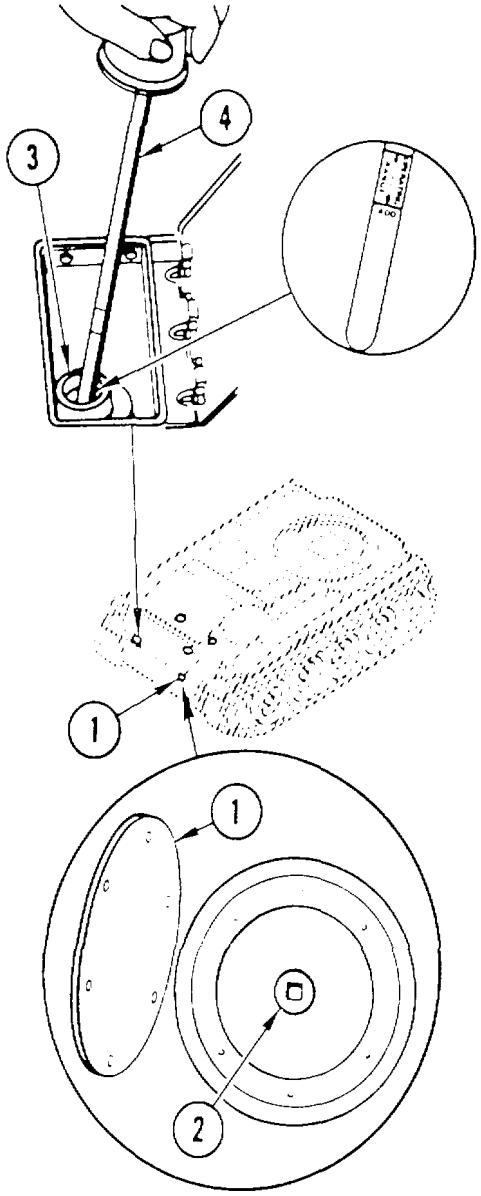
G Run until oil temperature gage reads 180OF (820C), then run engine at 1 200 to 1600 rpm for 1 to 3 minutes with transmission in neutral to stabilize oil temperature between 180°F i82°C) and 200°F (93°C).

CAUTION

Do NOT check oil with engine running Do NOT overfill.

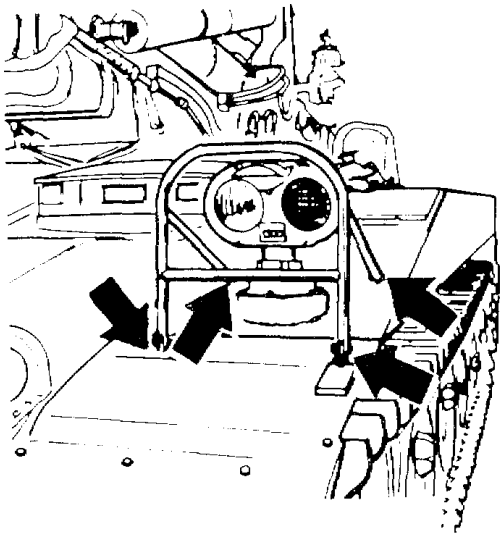
H Stop engine and wait 3 to 5 minutes. Check that oil level is within OPERATING RANGE on gage (4) Do not add or drain oil if in this range Add oil only when below ADD mark.

J Add or drain oil as required.

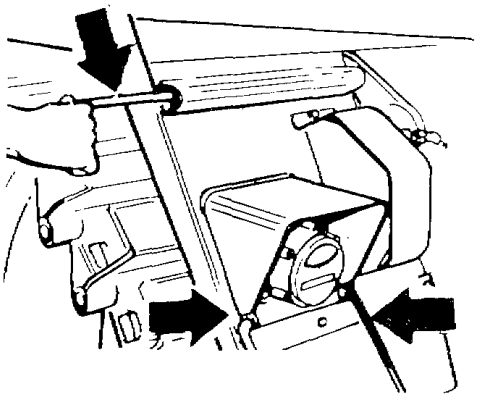


OIL CAN POINTS

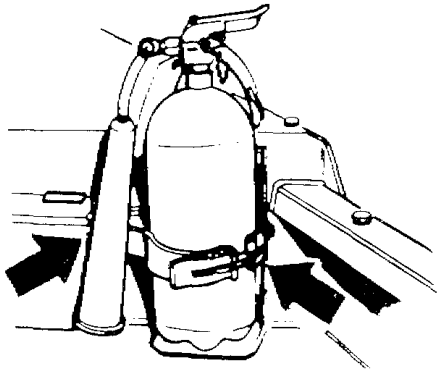
Quarterly, lubricate with CLP



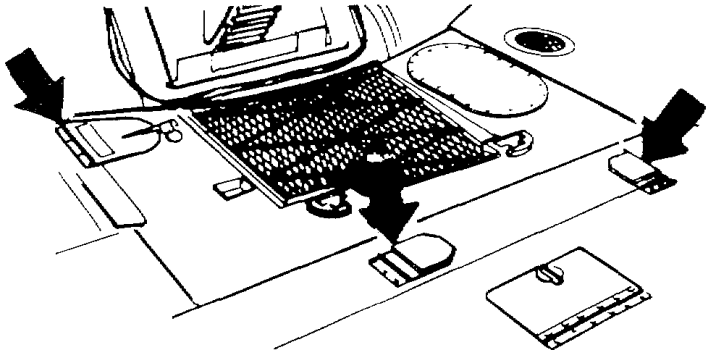
HEADLIGHT GUARD ASSEMBLIES



SPADE CONTROL VALVE LEVER AND FENDER EXTENSION STEP



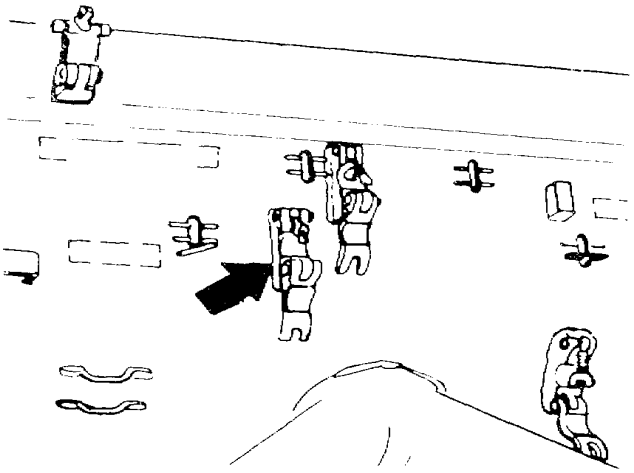
FIRE EXTINGUISHER BRACKET HINGES



RADIATOR AND FUEL FILL COVER HINGES

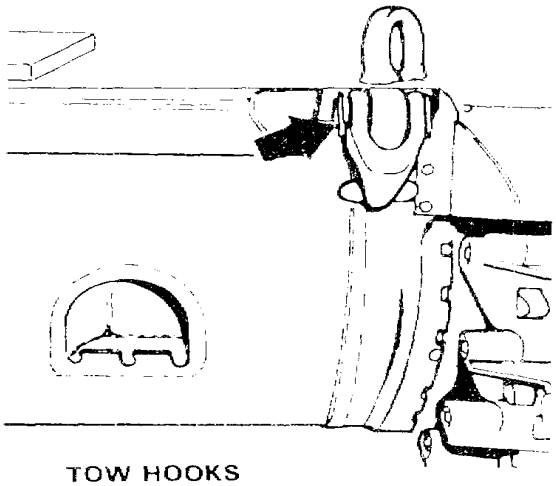
OIL CAN POINTS (CONTINUED)

Quarterly, lubricate with CLP

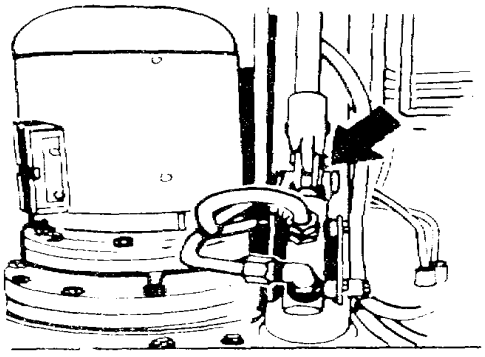


STOWAGE BRACKETS HINGES AND PINS (TYPICAL)

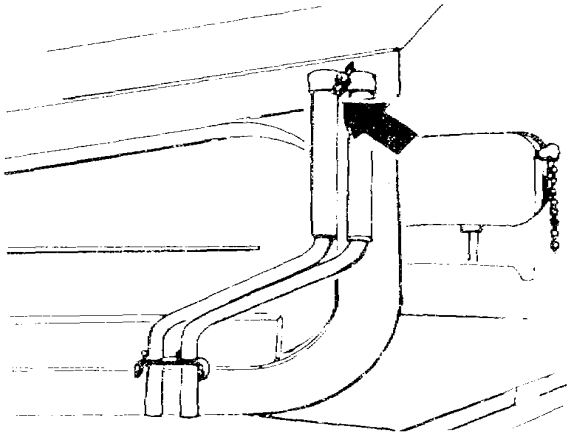
TIEDOWN BRACKETS (TYPICAL)



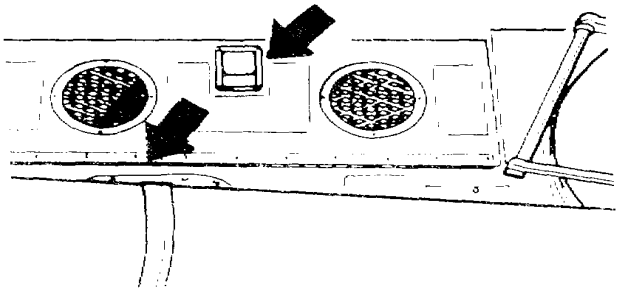
TOW HOOKS



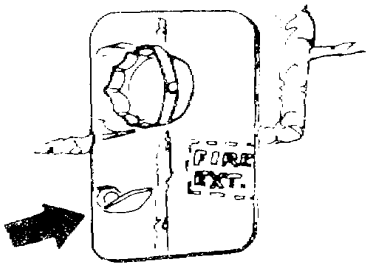
HAND DRIVEN HYDRAULIC RAM PUMP



RAMMER HANDCRANK MOUNTING BRACKET



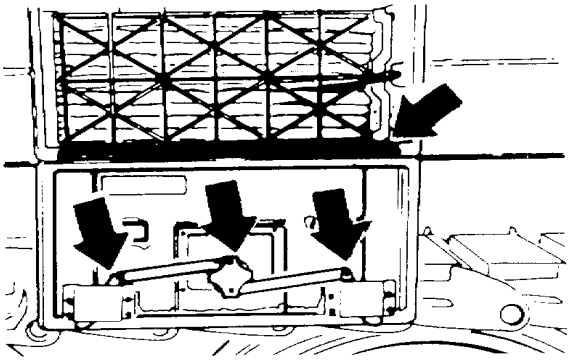
BATTERY COMPARTMENT DOOR HINGES AND LATCHES



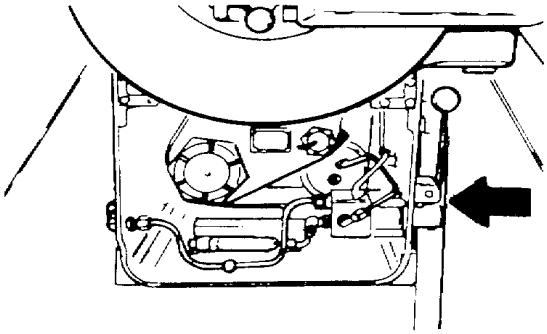
FIRE EXTINGUISHER CYLINDER CO_2 CONTROL RELEASE (HULL AND DRIVER'S COMPARTMENT)

OIL CAN POINTS (CONTINUED)

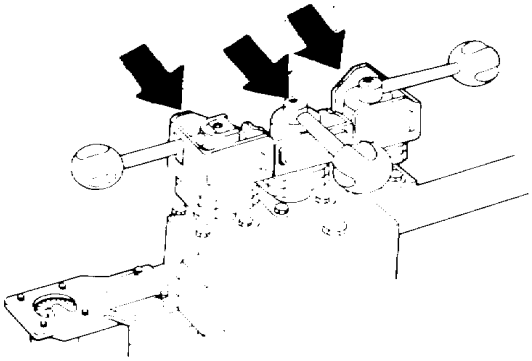
Quarterly, lubricate with CLP



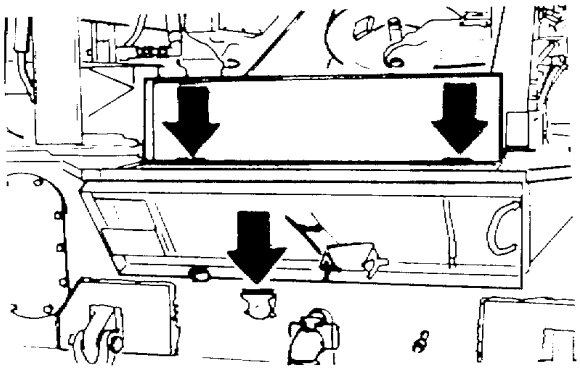
AIR CLEANER ACCESS DOORS
HINGES AND LATCHES



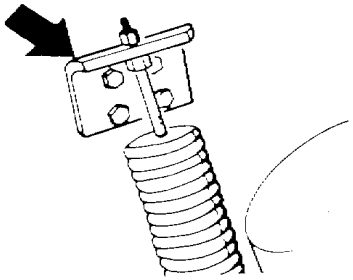
RETRACTING VALVE HANDLE



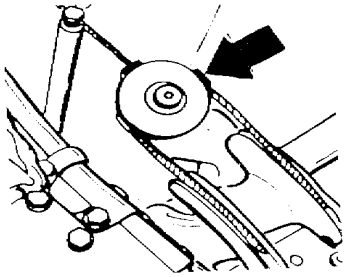
LOADER AND RAMMER CONTROL
VALVE HANDLES



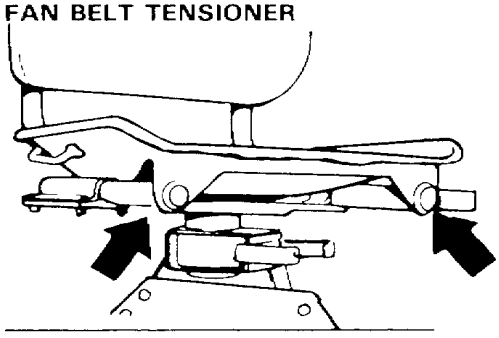
STOWAGE BOX HINGES (TYPICAL)
TRAILER RECEPTACLE COVER ASSEMBLY



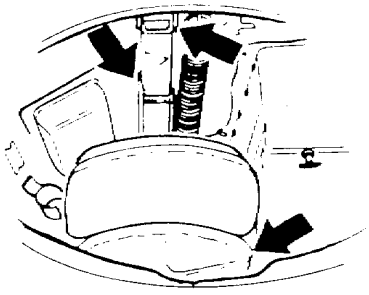
FAN BELT TENSIONER



BRAKE CABLE PULLEY



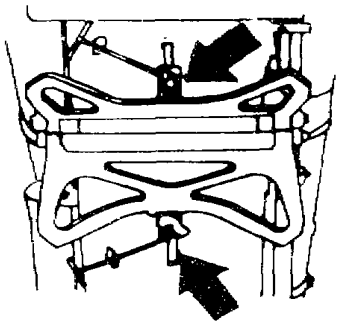
CREW SEATS MOVING PARTS



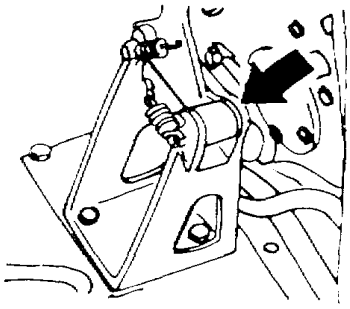
DRIVER'S SEAT MOVING PARTS

OIL CAN POINTS (CONTINUED)

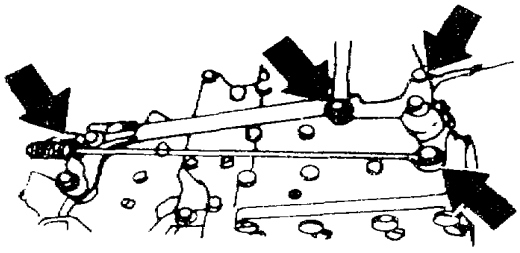
Quarterly, lubricate with CLP



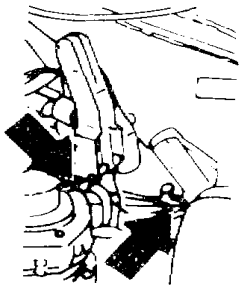
TRAVEL LOCK SUPPORT STOW LOCK



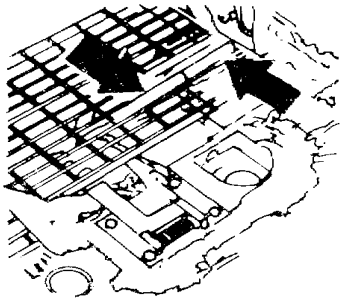
LOADER-RAMMER STOW LOCK



ENGINE CONTROL LINKAGE THREADED PORTION OF RODS AND YOKES, AND THROTTLE YIELD LINK



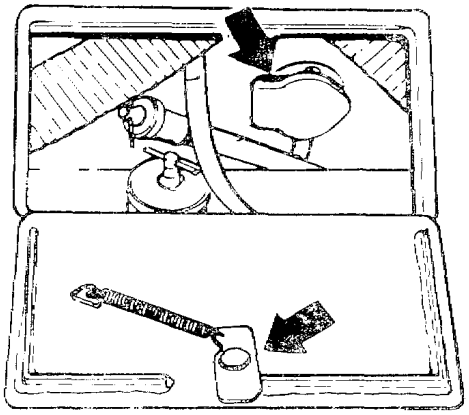
GUNNER'S CONTROL HANDLE RETAINING PINS



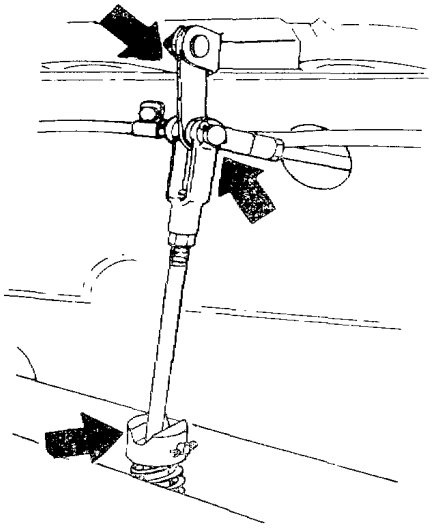
TRAVEL LOCK SPRING AND LATCH SLIDING SURFACES

OIL CAN POINTS (CONTINUED)

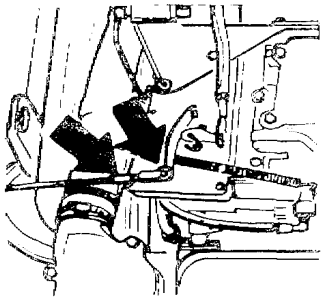
Quarterly, lubricate with CLP



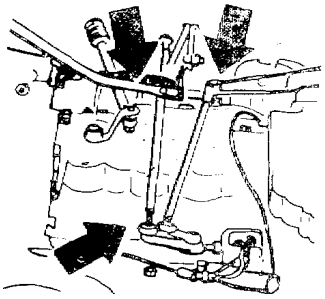
ENGINE DECK DOOR HINGES



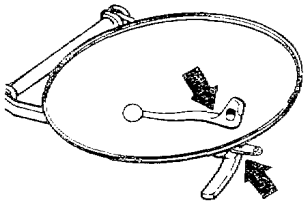
HULL DRAIN VALVES



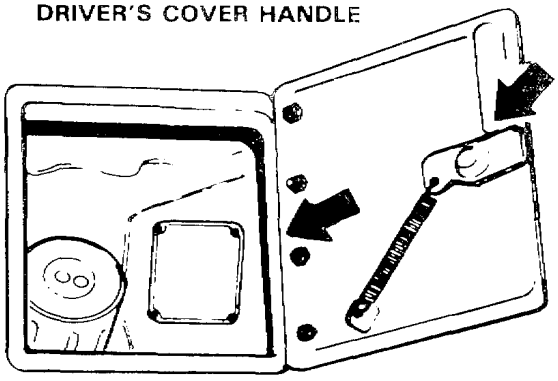
ENGINE SHUT-OFF CONTROL AND CABLE



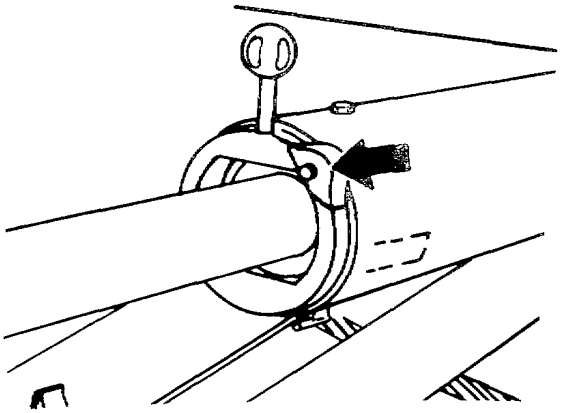
ENGINE CONTROL LINKAGE THREADED PORTION OF RODS AND YOKES



DRIVER'S COVER HANDLE



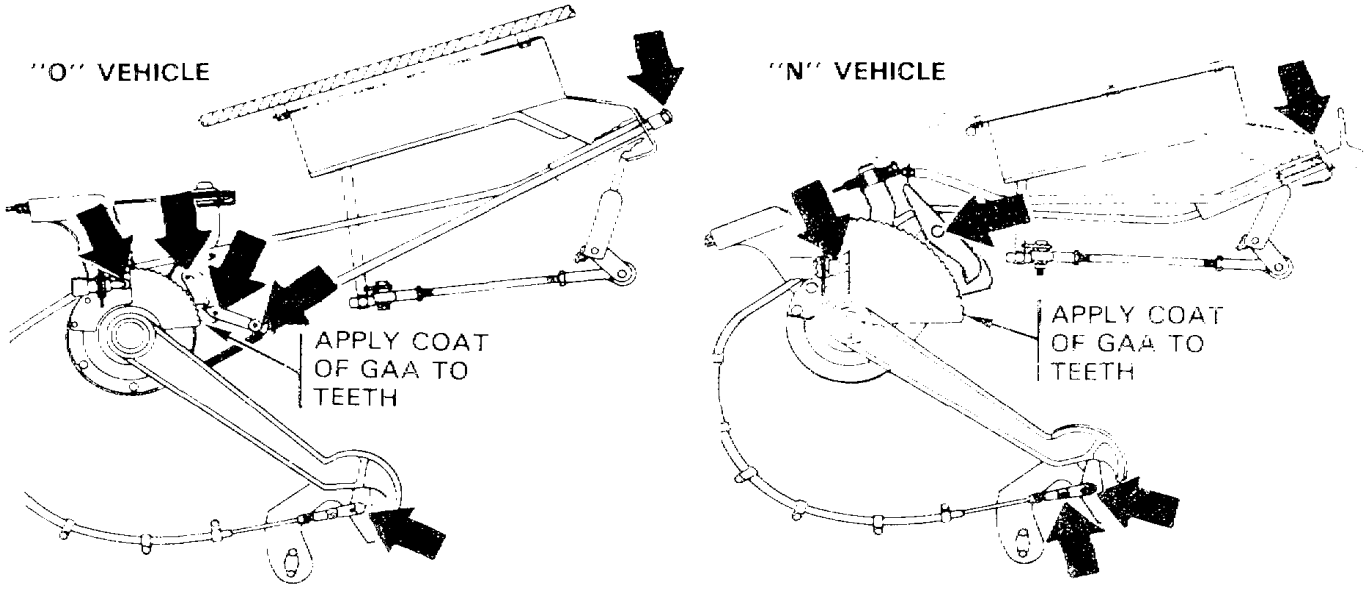
TRANSMISSION AND ENGINE DECK DOOR HINGES (TYPICAL)



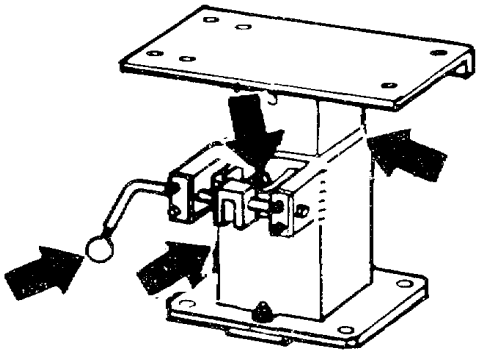
SPADE CYLINDERS DETENT LOCK

OIL CAN POINTS (CONTINUED)

Quarterly, lubricate with CLP



BRAKE CONTROLS MOVING PARTS



GUNNER'S SEAT MOVING PARTS

LUBRICATED AT TIME OF ASSEMBLY BY SUPPORT MAINTENANCE

The following parts are lubricated at time of assembly:

- Starter
- Generator
- Elevating drive assembly
- Traversing drive assembly
- Lockout cylinders
- Engine mounting bolt
- Loader-rammer traversing cylinder assembly
- Fan assembly

DO NOT LUBRICATE

Do not lubricate the following parts:

- Hydraulic pump electric motor
- Winterization kit electric fuel pump and coolant pump
- Personnel heater motor
- Driver's heater motor

NOTES

1 New engines are delivered with preservative oil MIL-L-21260 (see DD Form 1397). Unless an oil change is necessary to meet ambient temperature requirements or until first scheduled oil change, maintain proper oil level by adding OE/HDO or OEA as required for expected temperatures.

At time of powerplant removal, clean and coat threads on engine bolt with GAA. Do not lubricate bracket mounting screws.

2 New transmissions are delivered with preservative oil MIL-L-21 260. Until first scheduled oil change, maintain proper oil level by adding OE/HDO or OEA.

3 Perform a quarterly lubrication after any fording operation.

4 Perform complete servicing of all lubrication points when a vehicle which has been in storage for an extended period of time is put into service.

5 Before initial start of new or overhauled engine, or one removed from storage, remove both rocker assembly covers and pour one quart of oil (OE/HDO or OEA) over rocker arms and push rods. Use oil required for expected temperature.

By Order of the Secretary of the Army:

CARL E. VUONO
General United States Army
Chief of Staff

Official.

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

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